The RUBBER AGE

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LATE NEWS of the Industry

Goodrich Offers to Buy Miller Rubber Company

Acquisition by Exchange of Stock May Elevate Goodrich to Second Rubber Company in Country

DIRECTORS of the Miller Rubber Company on January 20 approved an offer by the B. F. Goodrich Company to purchase the Miller assets through an exchange of stock, the acceptance of the proposal being subject to the approval of the stockholders at a meeting scheduled for February 17. The purchase will be accomplished by the issuance of 113,504 shares of Goodrich common stock, worth $4,823,920 at the market price of $42.50 a share on January 20, and will elevate Goodrich to second place among the rubber companies of the world.

The current selling prices of Miller and Goodrich stocks on the New York and Cleveland Stock Exchanges indicate that on an even exchange basis, the ratio would be ten shares of Miller common for one of Goodrich and four shares of Miller preferred for three shares of Goodrich common. The Miller Rubber Company's capital stock consists of 112,773 shares of 8 per cent cumulative preferred of $100 par value and 260,264 common shares of no par value.

This acquisition by the B. F. Goodrich Company, if ratified, would mark the second important absorption by Goodrich in less than six months. In September of last year, Goodrich completed the acquisition of the Hood Rubber Company. After giving effect to the Hood merger, the total assets of the B. F. Goodrich Company and its subsidiaries came to $168,418,008. Total assets of the Miller Rubber Company as of June 30, 1929, amounted to $20,426,303, of which $12,053,168 were current assets, consisting of cash, inventories and notes and accounts receivable.

The Miller Rubber Company was established in 1892 by Jacob Pfeiffer, present chairman of the board of directors, and a few associates. Starting in a single-story frame building, 20 by 50 feet in size, with only a few hundred dollars as capital, the organizers worked the business up to a position among the first ten rubber manufacturers of the country. Annual sales volume of the company has not been made public in recent years, but in 1923 it was as high as $29,188,123.

Rated among the first eight or ten makers of rubber tires and tubes, the Miller company also produces a general line of tire accessories, footwear, druggists' sundries and mechanical rubber goods. These products have been distributed through more than 120 factory-controlled branches and distributors, while agents of Miller products are located throughout the United States and in foreign countries as well. Although Miller has never attempted to establish any foreign factories, it licensed the Industrial Rubber Manufacturers, Ltd., to manufacture Miller products in England in September, 1928.

Prior to 1926, the company operated on a very profitable basis but subsequently, owing to the sharp reduction in crude rubber prices and the intense competition among domestic manufacturers, its operations have not met with such pronounced success as formerly. Since June 1, 1928, on which date the quarterly dividend on the preferred stock was passed, nothing has been paid on the stock. Dividends on the common shares were discontinued in January, 1928, prior to which $2 yearly had been paid for two years.

The name of Miller was prominently linked up with that of the Goodyear Tire & Rubber Company two years ago when a number of executives of the latter organization, headed by L. C. Rockhill, went to the smaller company in an effort to bring it back to its former position. In addition to Jacob Pfeiffer as chairman of the board, the present officers of the Miller company include William Pfeiffer, president; L. C. Rockhill, vice-president in charge of sales; R. T. Griffith, vice-president in charge of production; and C. T. Grant, vice-president. The chairman of the board of the B. F. Goodrich Company is D. M. Goodrich, son of the late Dr. B. F. Goodrich, and the president is James D. Tew.

Approval of the present consolidation plans will require the affirmative vote of two-thirds of each class of stock of the Miller Rubber Company. "In order to procure the requisite consent of the Miller Rubber Company stockholders," an official announcement says, "it is considered necessary that the consideration be divided between common and preferred stockholders on an equitable basis. Committees to represent each class of stock will be appointed to determine the basis of distribution and to procure the requisite consent of the stockholders to such distribution."

United States Rubber Company Names William de Krafft as Vice-President

DIRECTORS of the United States Rubber Company at a meeting on January 7 elected William de Krafft a member of the executive committee and a vice-president of the company. They also confirmed his appointment as a member and chairman of the finance committee.

Mr. de Krafft had previously been in charge of the finances of the Baldwin Locomotive Works for 23 years. After his graduation from the Germantown Academy in 1895, he secured a job in the shops of the Baldwin Works, where for five years he did odd jobs as a boy. In 1900 he was moved to the general offices and placed first in the purchasing department and later in the cashier's department where he got his first insight into locomotive financing.

W. DE KRAFFT

With the retirement of George Burnham, Jr., as the financial member of the firm of Burnham, Williams & Company, on December 31, 1906, Mr. de Krafft was placed in charge of the finances of the works. In 1911, with the incorporation of the business, he was elected secretary and treasurer and in 1918 was made vice-president in charge of finance and treasurer.

He is a director of the Philadelphia National Bank, Southwark Foundry & Machine Company, Baldwin-Southwark Corporation, chairman of the board of Anderson, Meyer & Company of Shanghai and New York, and vice-president in charge of finance and treasurer of the Standard Steel Works. Due to the international aspect of the business of the Baldwin Locomotive Works, Mr. de Krafft has had an unusual experience in financial and credit operations, particularly in the post-war period when the world's financial structure was badly disarranged.

United States Rubber Consumption Was 23,531 Tons During December

CONSUMPTION of crude rubber of all classes by manufacturers in the United States in the month of December is estimated at 23,531 long tons, according to the statistics compiled by the Rubber Manufacturers Association. This compares with estimated consumption of 27,659 long tons in November and 31,232 long tons in December, 1928. The figures reveal an extremely low volume of activity in the tire industry at the close of the year, as the December total was the smallest monthly absorption since July, 1924, when the United States used only 23,396 long tons.

Despite the sharp falling off experienced in the final months, the year's rubber consumption established a record total of 467,593 long tons, according to the questionnaire reports of the Rubber Manufacturers Association for the first three quarters of the year combined with the last three monthly reports. Consumption during 1928 totaled 442,227 long tons, and in 1927 it reached 372,528 long tons.

Stocks of crude rubber on hand and in transit overland on December 31 totaled 105,138 long tons, as compared with 92,219 long tons at the close of November and with 66,166 long tons on December 31, 1928. The amount of crude rubber afloat to American ports at the close of the year was 62,389 long tons, comparing with 62,358 long tons on November 30.

The combined figure for stocks on hand and afloat, 167,527 long tons, is the highest on record for the American industry, being approached only by the total reported at the end of last April of 163,068 long tons. The large increase in stocks on hand at the end of the year is due to the heavy imports, estimated by the association at 43,542 long tons, and the small consumption.

Consumption of reclaimed rubber is estimated by the association at 11,089 long tons for December and 224,908 long tons for the year. Corresponding figures are 14,742 long tons in November; 13,233 long tons in December, 1928; and 223,422 long tons for all 1928.

Motor Parts and Accessory Business Is Lower at the Turn of the Year

MANUFACTURING operations in the automobile parts and accessory industry declined in November and continued a seasonal recession in December, as was expected. The business of automotive wholesalers was also lower, but is still considered generally good, according to the Motor and Equipment Association, of which several rubber manufacturers are members. Output in the industry will probably resume a moderate upward trend through the first quarter of 1930.

Aggregate shipments in November of a large and representative group of manufacturers in the Motor and Equipment Association were 90 per cent of the January, 1925, base, as compared with 156 per cent in October and 150 in November, 1928. Parts and accessory makers selling their product to the car and truck manufacturers for original equipment made shipments aggregating 81 per cent of the January, 1925, base figure, as compared with 160 per cent in October and with 163 per cent in November, 1928.

Litchfield Sees Production Increase In the Tire Industry During 1929

GRADUAL improvement in the rubber industry and an appreciable increase in tire production this year such as to permit Akron plants to operate on a more level schedule without any reduction in wages were predicted by P. W. Litchfield, president of the Goodyear Tire & Rubber Company, in his address at the annual meeting of the East Akron Board of Trade on January 13. His remarks were interpreted by local newspapers as an answer to some phases of the criticism of the management of the rubber industry made by F. A. Seiberling earlier this month upon retiring from the presidency of the Rubber Manufacturers Association.

"There is a shrinkage of almost a million cars in the original equipment market," said Mr. Litchfield in discussing the prospects for this year, "but there is a real gain in the quantity of renewal business that must be provided for in 1930. The renewal demand becomes apparent two years after a car is built and marketed. We are thus able in the tire industry to forecast a sizable increase in production as for 1930, and Akron will obviously claim her share of that business.

"We will not approach in employment the peak attained last year, but the activity of our plants will build up gradually and will maintain a far more even level throughout the year. There will be no reduction in wage scales and, as we progress this year, the summer months will find us nearing the maximum."

Briefly sketching the history of the rubber industry, Mr. Litchfield pointed out that the 26,400,000 car owners

registered last year paid as a whole no more for their tires than did the 7,500,000 car owners of 1919. Commenting on the fact that new standards have swept away a large proportion of tire factories that existed ten years ago, he observed that the car owner to-day pays "only one-sixth or one-seventh of what he did per mile in tires during the days when every cross roads boasted a tire factory."

"We enter 1930," declared Mr. Litchfield, "not overburdened with tires and prepared perhaps as never before, with our decks cleared for action. Manufacturers of automobiles are good traders and manage to buy original equipment cheaply, but it is difficult to estimate the value of that business and the advantage that innures to the tire maker.

"We are forced to look at it also from another viewpoint—we must assist the auto maker in cutting costs, so that he in turn may reduce prices and manage a wider distribution."

United States Rim Output in 1929 Slightly Lower Than During 1928

PRODUCTION of automobile and other rims during the month of December proved to be not enough to bring the year's total up to that of 1928. During last month the number of rims inspected and approved by the Tire & Rim Association, Inc., totaled 879,259, as compared with 596,989 in November and with 1,101,193 in December, 1928.

This brings the total rim output for 1929 to 24,141,502, a decrease of 105,780 from the 1928 production of 24,247,282 rims. While well above the 1927 output of 19,700,003 rims, the 1929 total fell below the 1926 and 1925 rim production figures of 24,199,524 and 26,001,664, respectively.

Until November, rim production in the United States last year had continued to be appreciably above 1,500,000 every month. During the first ten months of 1929, the output averaged 2,266,525 a month with an all-time record high mark of 2,729,899 rims being turned out in April. November and December marked the only two months since late 1927 that rim production has dropped below the million-mark.

Of the total rim output last year, 80.3 per cent were balloon sizes as compared with 81.6 per cent in 1928. Last year saw a considerable decline in the 21-inch sizes and a corresponding increase in the 19- and 20-inch balloon sizes.

Airplane rims showed a gain in production during 1929, with a total of 24,113 being turned out as against 18,383 in the year previous.

Report of New Anglo-Dutch Agreement Forces Price of Crude Rubber Higher

BELIEF that conversations between British and Dutch rubber growers, which began on January 17, might lead to a definite effort at restriction of production caused a rapidly weakening crude rubber market to rally and gain appreciably in strength. On the morning of January 11, members of the Rubber Exchange of New York were bidding only 13.80 cents a pound for January delivery in the commodity, but on January 17 actual sales were made as high as 15.40 cents a pound.

A cable from The Hague stated that at a meeting of the Anglo-Dutch rubber producers, headed by Professor Treub, it was decided to form a combined Anglo-Dutch committee which will carry on the work of studying the question of rubber production. British delegates, headed by H. E. Miller and including Messrs. Bingley, Mathewson and Daukes, were said to be agreeable to working out a co-operative scheme with the Dutch growers. The parties have mutually decided not to publish any reports regarding the negotiations, and, consequently, no details are obtainable from official sources at the present time.

A few days earlier, however, an Amsterdam cable reported that producers of crude rubber in the Dutch East Indies had formulated a new restriction plan calling for a reduction of from 10 to 20 per cent in the outputs of both native and European producers. Under this plan for the restriction of tapping, the European producers would deposit 20 florins per ton and the native, or uncontrolled producers, 2 cents per kilogram, which would be forfeited in the event of non-fulfillment of obligations.

Doubt whether either British or Dutch interests would be able to carry out their proposals apparently entered the market a few days later, for on January 20 the price of rubber for the current month had dropped back to as low as 14.50 cents a pound and showed a tendency to go lower once again.

Goodyear Airship "Puritan" Wrecked In Crash in Mountains of Kentucky

THE non-rigid airship "Puritan" of the Goodyear Tire & Rubber Company was almost completely wrecked on the morning of January 11 when it ran into a mountain side ten miles east of Campton, Ky., while bound for Miami, Fla., via Gadsden, Ala. Neither V. L. Smith, pilot, nor A. C. O'Neil, navigator, was injured.

After leaving Akron the night previous, Smith had directed the course of the ship low in order to avoid the worst portion of a sleet storm which overtook the craft in the rugged Kentucky country. He had first tried to climb above the storm, but had failed to do so and had to come down to see if he could get to the level at which it turned to rain. With visibility poor and the blimp weighted down by ice formations, Smith was unable to surmount a mountain peak with the result that the cabin caught in the tops

The Goodyear Airship "Puritan"

of the trees and the craft pulled down, the bag tearing and the cabin dropping to the ground.

The scene of the accident is an uninhabited and practically untravelled portion of Kentucky. The pilots were several hours in making their way from the wreck to Campton and the nearest telephone. Roads in the vicinity are practically impassable, and a truck crew from Akron experienced considerable difficulty in removing the wreckage.

Had a similar accident occurred with an airplane, all aboard would have been killed, Goodyear officials stated upon receiving news of the crash.

The "Puritan" was launched in August, 1928, with a

length of 128 feet and a gas capacity of 86,000 cubic feet. It originally cost $55,000. Following an accident in Detroit about two months ago, it was enlarged to 137 feet in length and 100,000 cubic feet in gas capacity.

Production of Tires During November Totaled 3,603,436 Pneumatic Casings

TIRE manufacturers in the United States produced a total of 3,603,436 pneumatic casings during the month of November, according to estimates issued by the Rubber Manufacturers Association. Total production of inner tubes is estimated at 3,780,419 and total production of solid and cushion tires at 40,667 for the month.

Total shipments during November are estimated as follows:

Pneumatic casings, all classes	3,557,759
Inner tubes	3,711,840
Solid and cushion tires	32,927

Inventories as of November 30 are estimated as 12,935,220 for all pneumatic casings; 13,701,324 for inner tubes, and 156,436 for solid and cushion tires.

The tire industry is estimated to have consumed a total of 41,581,104 pounds of crude rubber and 13,691,693 pounds of cotton fabric during the month of November in the manufacture of all types of pneumatic casings, inner tubes and solid and cushion tires.

The association's estimates are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States.

Goodyear Predicts That 1930 Will Be Greatest Year for Tire Renewal Trade

THE Goodyear News, dealer publication of the Goodyear Tire & Rubber Co., of Akron, in its January edition, will say, "While the last half of 1929 witnessed a sub-normal demand for renewal tires, resulting in total sales for the year 1929 of but approximately 47,000,000 tires against 49,500,000 in 1928, we confidently risk a prediction that 1930 will be the greatest year in the history of the tire business for the sale of tires for renewal, purposes and that this market will be engaged in by the smallest number of competitive companies in 15 years.

"Since the very drastic business depression of 1920 and '21, there have occurred two periods classed as minor depression years, namely 1924 and 1927. The remaining years were good business years and especially 1928 and 1929. Business is now faced with an incoming year of somewhat reduced volume as compared to this previous level. We do not expect a severe business decline in 1930 but rather one that will approach in degree and extent those of 1924 and 1927.

"Renewal tire business in this country is based on some 25,000,000 motor vehicles which will be running off the miles in 1930 just as a few less millions did in 1929 and 1928.

"The number of inactive used cars in the hands of car dealers has increased considerably over the past few years. At the present time, there is a concerted effort by car dealers over the country to move their inventory of used cars. Such an effort should help materially the renewal sales in 1930.

"Other factors working to increase the consumption of tires, are the longer jumps that are being made by the average motor car, due to better highways; four-wheel brakes and continued improvement in their effectiveness; more stopping and starting, due to traffic lights and traffic congestion; and increased year around driving.

"We have stated that the 1930 renewal tire market will be engaged in by the smallest number of competitive manufacturers in fifteen years. Competition has been very keen and the mortality rate has been terrific, as shown by the following table of the number of active tire companies operating in the United States on the first of each year:

1922	166	Tire Companies
1923	129	" "
1924	111	" "
1925	97	" "
1926	93	" "
1927	92	" "
1928	78	" "
1929	62	" "
1930	50	" "

Charge African Chiefs with Supplying Slave Labor to Firestone Plantation

THAT actual slavery is being practised by Liberian tribal chieftains in providing contract labor for the plantations of the Firestone Tire & Rubber Company is a fear expressed by the Foreign Policy Association in a report issued January 12. The charges of forced labor allegedly practised by Liberian officials are soon to be investigated by an international commission to which the State Department recently appointed Dr. Charles S. Johnston, professor at Fisk University, as American representative. The international labor office at Geneva is interested in the charges and the investigation.

Another attack on such forced labor was made last October by Senator Blaine of Wisconsin, who succeeded in placing in the tentative tariff bill a clause to exclude from the United States all products of "indentured labor under penal sanction."

Foreign Retail Gasoline Prices

THE following tabulation showing the retail price of gasoline in various leading centers of the world on or about September 30, 1929, has been recently compiled by the Petroleum Section, Minerals Division, of the Department of Commerce. The price quoted for the different countries cannot, of course, be used for comparative purposes without taking into consideration the various factors which tend to make inequalities in price, such as distance from the source of supply, quantity consumed, transportation costs, import duties and excise taxes, and many others, but the figures are of interest in connection with the increasing automobile sales throughout the world.

Country	City	Price in U. S. cents per Gal.
Argentine	Buenos Aires	35.1–48.1
Australia	Sydney	46.5–48.6
Brazil	Rio de Janeiro	42.7
Ceylon	Colombo	46.8
China	Shanghai	27.4–29.5
Cuba	Havana	28.
France	Paris	34.3–35.8
Germany	Munich	28.9
India	Calcutta	39.
Italy	Genoa	40.7
Japan	Tokyo	21.9–25.7
Mexico	Vera Cruz	31.8
Netherlands	The Hague	27.
Panama	Panama City	32.
Philippines	Manila	38.
Union of So. Africa	Johannesburg	55.
United Kingdom	London	34.5

Gasoline sold at the highest price in Nairobi, Kenya, at 68 cents per gallon, with La Paz, Boliva, a close second at 64.8 cents.

F. A. SEIBERLING

Seiberling Hits STRAIGHT *from the* SHOULDER

Calls Upon the Industry to Stop Handling Business "Like Wolves in The Jungle"—Considers Merchandising Below Cost as Dishonest Practice and Calls for Greater Coordination and Cooperation in Production.

EDITOR'S NOTE: *The following address by F. A. Seiberling, retiring president of the Rubber Manufacturers' Association, was delivered on the occasion of his last appearance as the head of the organization at the annual banquet at the Hotel Commodore, New York City, January 6, 1930. Because of the very outspoken and vigorously phrased truths it contains, it is here reproduced in full.*

MANY of you gentleman may not know it, but this is the thirtieth annual dinner of the Rubber Association, either the Rubber Club, The Rubber Association of America, or The Rubber Manufacturers' Association. They have lived for thirty years and incidentally, if I may add to the antiquity of the occasion, this is my thirty-third year in the rubber business. I notice Harvey Firestone antedated me by two years, but I started my concern two years before he did.

This is the sort of an occasion when everybody ought to feel good and we ought to go away happy. As I haven't any prepared address, I am going to talk to you intimately just for a minute. Let us lay the black page down first. You heard the Governor's (Governor Christianson of Minnesota) address. He is one of the apostles that wants farm relief, and if you can believe him—and I do—they need it. But in order that the Governor may not go away from here feeling that the farmer is the only one that is entitled to relief, I want to tell him something about the rubber business.

Governor, I am going to quote these figures: Thirty years ago when this Association was organized, we had 301 industries of all kinds in the rubber business, with 36,000 wage earners. The total volume of the business of the United States at that time in rubber was $99,000,000. Today, of all kinds of rubber manufacturers, not limited to tires, because those fellows have been shrinking in number, we have 450 industries big and small. We have over 150,000 wage earners, and the business in the year 1929 approximates $1,200,000,000. That is some record. I think it is a record of progress in the industry matched only perhaps by the automobile industry.

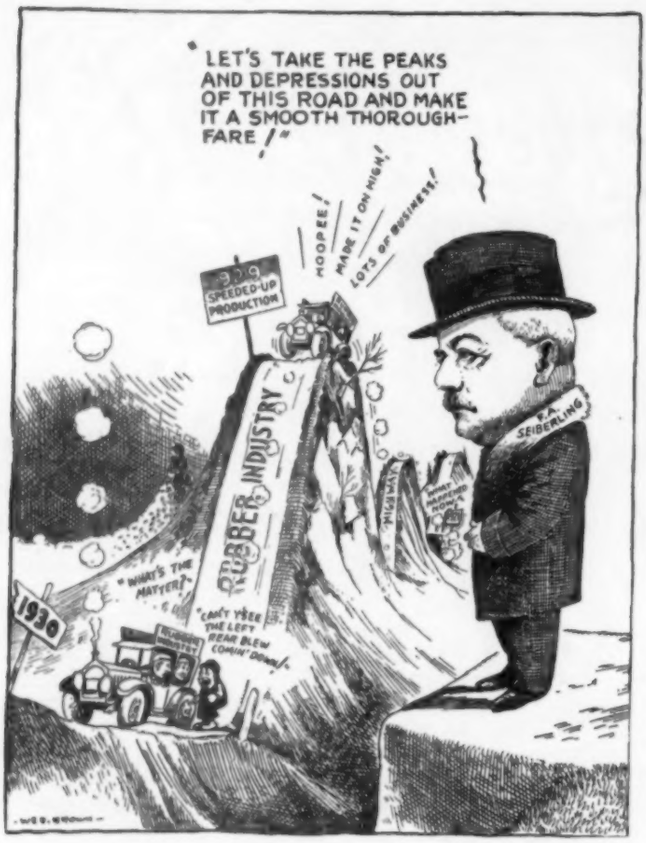
Now we are in a time that they call recession. We had something of that sort of experience about nine years ago, when we had a cataclysm of distress world-wide in scope, the most severe business depression in all history. Today we have a recession that affects only our own country. But that the Governor may go back to the Northwest with a picture of one of the industries that isn't feeling very well, I want to tell him something of what has happened the past nine years in the rubber industry.

We have in the past nine years handled in the rubber business a volume approximating $10,000,000,000. The actual figures are $9,986,000,000, and some odd dollars. We have paid in dividends of all kinds during that period less than $180,000,000. In other words, considerably less than 2 per cent on that turnover.

We have within the past eighteen months put nearly $200,000,000 of new capital in the rubber business to fill up the gap of losses made before, and some of us apparently are proud of the position of the rubber industry today. We are handling the rubber business today without rhyme or reason. We are in the rubber business today making an actual loss in certain branches of it, and I noticed when my friend, Firestone, referred to some of the tires being sold to the manufacturers of automobiles at cost, my friend Swayne here, slipped back as though ashamed of himself. He hasn't any reason to be, for no one in the automobile industry sought for such values, but the tire manufacturers themselves have been handling that business like the wolves in the jungle. It has been a case of outlaw work, every man for himself, until today, to their shame, they are selling their tires to these manufacturers not at cost but below cost. And I hold that that proceeding is dishonest, for it is dealing with a class on terms, unfair to a larger class, out of whom they must get more money to make up their losses on this side. I say that is to the discredit of the industry and I think the world ought to know it.

I am giving a black picture. We have come through the past year not in a very happy state. We weren't well coordinated, and so the first six months of the year we ran our factories full head, perhaps on the stock market wave, I don't know, but we landed in the middle of the year with the largest inventory of tires on hand that we had ever had on a first of July. The past six months we have been absorbing that inventory and we have had the recession. The stock market has helped the static end of it and made people a little gloomy. But the tragedy of it is that we had to throw men out of employment. There are one-third less workers in the rubber factories in the United States today than were operating last May and June, and we have got to learn in the future how to run our business so that we may keep an even trend, as near as we can, in the employment of labor.

It is not right to employ these men for one season in the year


"LET'S TAKE THE PEAKS AND DEPRESSIONS OUT OF THIS ROAD AND MAKE IT A SMOOTH THOROUGH-FARE!"
HOOPEE!
MAKE IT ON HIGH!
LOTS OF BUSINESS!
SPEEDED-UP PRODUCTION
RUBBER INDUSTRY
F.A. SEIBERLING
"WHAT'S THE MATTER?"
1930
"CAN'T YEE THE LEFT REAR BLEW COMIN' DOWN?"

Web. Brown in the Akron Beacon Journal

to full capacity and then throw them out on the streets for a period of three to six months hunting for a job. That can only be cured by a coordination and a cooperation among the leaders of the industry that shall take into account these changed conditions, anticipate them, and provide for them.

In your minds may be rising the question of the Sherman Act, the Clayton Act, the Valentine Act, and so forth, but the business world and the entire country has learned that those laws have become obsolete. They may have fitted the times forty years ago. They don't fit the times of today and they should be properly modified. We have learned that the dominant interest in all business is the public interest, and the public interest is not served by conditions that give us peaks and valleys, prosperity and distress, in the fashion that we are getting it in the industry today.

The Governor is building roads up in Minnesota so that we may have more automobiles. He wants the farmers to get better prices, which I am for, that they may buy more cars and operate them, but we have got to take care of our industry along the way or they will have no tires and no cars to operate when they get their farmer prosperity.

The rubber industry, as was said down in Washington recently, "is sound, fundamentally." I believe that, but I am telling you it isn't sound in its leadership, and that leadership must come together and coordinate and cooperate for the good of the whole country, for the good of their investors, for the good of their employees, or we will have repetitions of the same situation that we have had the past year.

I think we are coming together. You have got to go through the fire sometimes and get burned a little bit to get real rational in these matters, and we have been passing through a fire the past six months. I think we are at the dawn of a new day. I believe that the year 1930 is going to see this industry put upon a new basis, on a sound foundation, so that we may expect steady progress in the direction of better coordination, better cooperation, all within the law, for the benefit of the public, for the benefit of the inventors, and for the benefit of the employees all along the line. That is what I'm hoping for.

We are getting a good many panaceas on this recession business. I noticed the Secretary of Commerce in some statement made a few days ago, could see nothing but hope in the future, except for the automobile industry and the rubber industry. He picked out the two worst ones. Well, these poor automobile fellows are pretty low at the moment. They are not running very strong and the public seems to have more gloom about the business than they have themselves. They made about 5,600,000 cars in the past year. There is a general feeling that 4,500,000 is the very minimum that they will make next year, and wise heads are putting it as high as 5,000,000. Well, we would like to have them make the rest of those, up to 5,600,000, but I am sure that we can sell more tires on Mr. Swayne's old cars than we can on his new ones. You know, we can on Mr. Ford's because when we see those model T's, those Lizzies running along with wobbly wheels, bent rims and everything else, I know they are wearing out more tires than the new Fords will wear out.

At any rate the tire business, which is the major end of the rubber business, has promise the coming year of selling more of its product, making more profit for the industry, than it had in the year 1929. I am not looking at the future with any gloom. I don't think this is a time for any sentimental optimism or any morbid pessimism, but I think it is time to take a calm view of the whole situation. We passed through our 1920-21 cataclysm within a year or a year and a half. I think it is only a matter of a few months when this recession will straighten out and get in balance. I believe the rubber industry will drag for a few months, but I believe when the spring opens it is going to start strong. We will have more of a peak demand in the summer than last year.

I am closing my official connection with this Association tonight. I have great hope that through the wise administration of my friend Woolner, we will bring about that happy state of coordination which we are all hoping for. We must look to the success of our competitor as well as our own if we are to keep the entire industry healthy.

Reserve Officers From the Rubber Industry

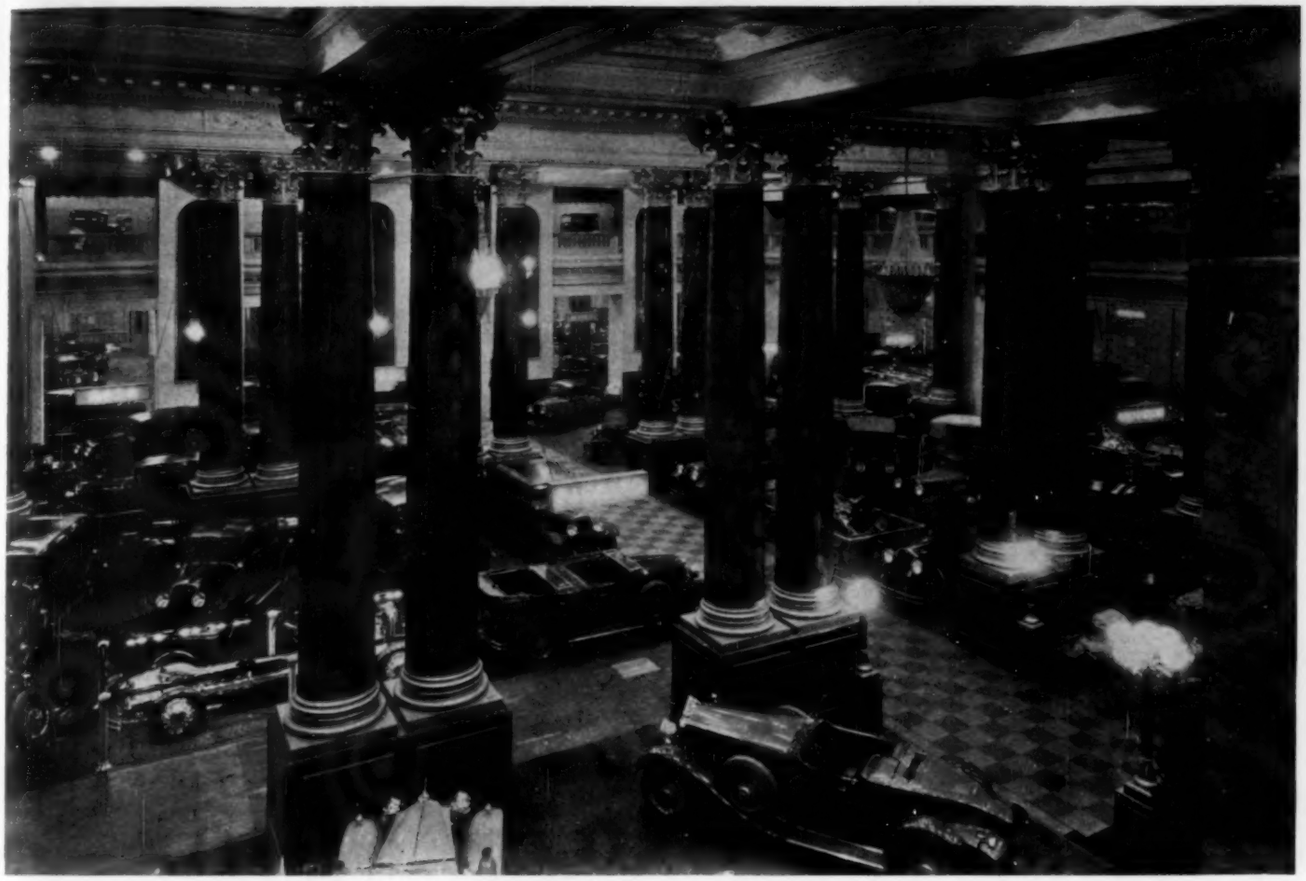
THE War Department desires an additional number of reserve officers for assignment to various units in the Procurement Service. These men will receive basic training during peace times so that they may aid in the purchase of supplies for the Army in the event of war. It is believed that there are many men within the rubber industry possessing qualifications which fit them for this work.

Many types of men and many qualifications are needed in the Procurement Service, including accountants, financial experts, industrial engineers, inspectors, lawyers, liaison officers, personnel experts, production specialists familiar with all types of commodities used in war, purchasing officers, research specialists, statisticians, traffic experts.

Ranks range from second lieutenant to colonel during peace time, with promotions as a probability in the event of a major emergency.

Any rubber men who feel qualified for such work and wish information on how to secure a commission in the Officers Reserve Corps in the Procurement Service, write to the chief of the service at the War Department, Washington, D. C.

Applicants will receive preliminary information by mail and an opportunity to talk with an officer stationed as near them as possible.



Annual Show Proves Boon to the Automotive Industry

High Record Sales and Enthusiasm Over the New Models Lends Encouragement to Manufacturers

THE 30th annual National Automobile Show was held at Grand Central Palace, New York City, during the week of January 6 and not only drew record crowds but exceeded all previous exhibits in the volume of actual sales reported to have been made. In accordance with the policy adopted by members of the Rubber Manufacturers Association, leading tire and rubber manufacturers were not represented by displays but in the new automobile models and particularly in the details of body construction there was much of interest to the rubber industry. The latest types of de luxe tires were used as original equipment but most significant of all was the many new applications to which rubber has been put in the general assembly of the latest models. It has been authoritatively stated that between 40 to 60 pounds of rubber are now used in the various parts of new model automobiles, exclusive of the tire equipment, and that from 100 to 400 rubber parts are used per car.

Rubber shock insulation in several cars was particularly featured and the new introduction of rubber flexible couplings. Gear boxes suspended on rubber pads, radiators supported on rubber pads and rubber covered hinges and window frames were also featured.

Tires were also prominently featured in connection with the displays of accessories and equipment manufacturers, particularly in the booths of the Aluminum Company of America, Bendix Products, Inc., and the Budd Wheel Company.

The American Hard Rubber Company again featured the Husted steering wheel, this year emphasizing the three spoke model in preference to the four spoke, claiming among the additional advantages of the new type, that the elimination of the fourth spoke permits the driver a clearer view of the instrument board. The new three spoke steering wheel is of one-piece hollow steel tubular core construction covered with a heavy coating of hard rubber and is claimed to be 15 per cent stronger than the regular four spoke wheel. The wheel cannot be broken or splintered in the event of crash or shock.

The Custom Built Tire Corporation, 161 West 64th Street, New York City, also displayed the new Martin custom built 11-ply tire for high class cars. The tire is con-

structed with extra heavy coatings of pure rubber between every ply; three extra squeeze rubber cushions for flexibility and abrasion elimination.

The Trautman Safety Tire and Tube Company, 414 Fourth avenue, Brooklyn, N. Y., displayed their puncture-proof tubes and tubeless tire.

The exhibits this year were attractively displayed with color emphasized in both car bodies and fittings. Eight cylinder cars predominated, but the exhibit of the new 16 cylinder Cadillac drew considerable interest. Luxuriousness in appointments also characterized practically all of the car exhibits.

The record attendance averaged 35,000 daily and much encouragement was given to the industry in general by the high rate of sales made, one manufacturer reporting sales to the extent of 52,000 cars for immediate delivery.

Besides the main show at the Grand Central Palace, there were a number of supplementary exhibits at various hotels. The Commodore Hotel held displays of the Duesenberg, Cord and Auburn, Oakland and Marmon. Graham Brothers also displayed at the Biltmore while Packard held forth at the Roosevelt. At the Pennsylvania the Dodge Brothers showed and at the Shelton, one of the most attractive displays was made of the imported Austin car. General Motors occupied the Astor.

The British Rubber Industry in 1929

THE British rubber-growing industry in 1929 passed through one of the most critical years in its history, due to the uncertainties and unknown factors brought about by the aftermath of a restriction scheme lasting six years, which came to an end thirteen months ago. The average daily price for 1929 is approximately 10d. (20 cents) per lb., in comparison with 10¾d. (21½ cents) for the whole of last year. The highest price during the year for spot delivery was 1s. 1¼d. (26½ cents) in February, a sharp rise having resulted from speculative operations. However, bear sales and adverse statistical features caused liquidations of forward positions from time to time, and the lowest level since April, 1928,—7½d. (15 cents)—was reached in November,—just a year after the removal of restriction.

Production, in terms of shipments from Eastern centers, has been extremely heavy and in excess of all market estimates, owing to very favorable climatic conditions prolonging the natural "flush," the result of the enforced resting of trees during the restriction period.

A factor that depressed the price during the year was the large forward contracts entered into by many estates at prices round 8½d. (17 cents) per lb., London terms, with optional Continental port clauses and for New York. No forward commitments of importance have been made for 1930—a satisfactory feature from the market viewpoint.

The expansion in consumption from all centers was a satisfactory feature which offset the increase in production last year. Demand from the United States increased by 7 per cent compared with 1928, while world consumption outside America increased almost 50 per cent.

Stock positions in all the consuming centers increased in 1929, as the large accumulations in the East, which were previously unexportable, found their way into stocks, and the bigger monthly shipments on the resumption of unrestricted output have been greater than the market could cope with. Comparative stock positions are as follows:—

	Nov. 30, 1929	Nov. 30, 1928
Singapore and Penang	32,598 tons	30,665 tons
London	52,538 "	18,724 "
Liverpool	17,752 "	2,213 "
U. S. A.	92,219 "	30,665 "

The result of low prices has made for more scientific and economical working of estates, making for lower costs all round, so that many companies are now able to show fair profits with the commodity at anything over 8d. per lb. A more favorable outlook may reasonably be taken for 1930, allowing for consumption being maintained, as the absence of forward contracts makes for a free market. Reduced yields are to be expected from estates after the first "flush," due to the resting of the restricting plantations.

The British rubber manufacturing industry has had a rather mixed year, especially the rainwear section. In the aggregate, business has probably been as good and turnover as large for waterproofers, garment makers, and cloth suppliers as it was in 1928, but trade has been far less steady, and for some sections of the industry substantially less remunerative.

Demand for waterproof apparel fell away almost completely at the end of October, 1928, when the cold spell set in. Business thereafter remained quiet for about five months. It is no exaggeration to say that between the beginning of 1929 and, say, May, the only rubberized apparel moving in bulk were cheap garments made of non-guaranteed proofing on a low cotton sheeting and retailing at about $1.25 each. Huge quantities of such coats were sold, and though the profit margins on this trade were practically non-existent, it kept a number of factories occupied.

May saw the introduction of the fleecy-lined waterproof coat, and this garment rapidly assumed such a popularity that it kept virtually the whole of the trade busy right through the remainder of the year, notwithstanding the dry summer.

The advent of the fleecy coat proved a blessing to the trade, for the customary business in lightweight Indianas and Japanese silks failed to materialize. Generally speaking, trade has only been good in machine-made garments.

There are also hopeful signs of a revival in the demand for double-texture Indianas, cotton cashmeres, and union cashmeres in putty shades for women's as well as men's coats.

In the waterproof industry trade was distinctly patchy throughout 1929, although some good orders were booked for high-grade garments. The trade is, on the whole, optimistic about the future, and the general feeling is that 1930 should be a good year if the weather is at all helpful.

The rubber footwear trade was exceptionally good last year. Demand for sports goods was fair, and there was a steady call for mechanical rubber goods. The tire trade was for the most part good, although the established manufacturers experienced more competition from new firms that have recently entered the British market. The British government placed a substantial contract for rubber ground sheets, the first for many years, and it is hoped that this may prove an annual order.

Acreage Under Rubber in Middle East

(At end of each year)

(Acreage figures in thousands, 000 omitted)

	1924	1925	1926	1927	1928
Malaya	2,369	2,417	2,525	2,645	2,728
Ceylon[1]	461	467	486	495	525[2]
India[2]	129	133	139	147	153
Br. Borneo[2]	154	167	195	206	210
Indo-China	95	115	155	205	225
Dutch Estates[2]	979	1,025	1,102	1,199	1,299
Native[2]	675	825	1,050	1,300	1,400
Siam	65	80	110	140	160
TOTAL	4,927	5,229	5,762	6,337	6,700

*As officially reported by the U. S. Department of Commerce.

[1]Ceylon figures from Rubber Controller; 1927 figures reported by Rubber Growers Association as 530,000, or much higher than above.

[2]Rubber Division estimates for Br. Borneo, Indo China, Dutch Native and Siam.

Outline of Tentative Standard Laboratory Procedure for the Preparation and

Physical Testing of Rubber Samples

Physical Testing Committee of Rubber Division, A.C.S. Completes Research and Submits Report on Recommended Procedure for Testing.

THE accompanying report on the work of the Physical Testing Committee, Rubber Division, American Chemical Society, marks the conclusion of the research work on the standardization of physical tests of rubber, which have been conducted since early in 1927, at the rubber laboratory of the Bureau of Standards, Washington, D. C., under the sponsorship of the Rubber Manufacturers Association, the Rubber Division, A. C. S., and a number of rubber companies.

The original committee was formed in October, 1926, by R. P. Dinsmore, chairman of the Rubber Division at that time. F. E. Rupert, research chemist at the Fisk Rubber Company, was chosen to conduct the research work. J. E. Partenheimer, also of Fisk, was chairman of the first committee, and was later succeeded by Dr. W. A. Gibbons, of United States Rubber Company, who in turn resigned last year and was succeeded by Dr. A. A. Somerville, of R. T. Vanderbilt Company, who has remained as chairman up to the present time.

Two progress reports were made by the committee, one on the "Importance of Temperature and Humidity Control in Rubber Testing," read at the April, 1927, Rubber Division meeting at Richmond, Va., and a later report on "The Effect of Humidity and Temperature on the Ability of Rubber Compounds to Resist Abrasion," presented in September, 1927, at Detroit. This report was later amplified and released for publication in December, 1927.*

Copies of the report printed below have been mailed to all members of the Rubber Manufacturers Association, but additional copies can be obtained by writing to Dr. A. A. Somerville, 230 Park Avenue, New York City, chairman of the committee. (EDITOR.)

THE most important physical properties of rubber compounds which are usually determined in the laboratory are the tensile strength and ultimate elongation or the entire stress-strain relationship. The other physical tests which may be made are so numerous and varied that for the purpose of standardization, it is advisable, first, to adopt uniform procedure and conditions for the entire laboratory treatment in the determination of the stress-strain relations.

Mill Data.—The rolls of the laboratory mill shall be 12" in width x 6" outside diameter and the working distance between the guides shall be 10½ inches. The speed of the slow roll shall be 24 R.M.P. and the gear ratio should be 1.4 or as near that figure as is compatible with engineering practice. (*Variation of 2 R.P.M. may cause 3% variation in tensile.*)

Mill Temperature.—No satisfactory method of controlling the temperature of the batch during mixing has been devised. However, it is recommended that the temperature of the water entering the mills be maintained at 158° F. (70° C.).

It is certain that with sufficient water passing through the rolls and a uniform initial temperature of 158° F. (70° C.), the process of mixing can be made much more uniform. It is recommended that the initial temperature of the rolls be 158° F. (70° C.) which can be attained by the flow of 158° F. (70° C.) water.

*THE RUBBER AGE, Pg. 245-248, December 10, 1927.

Mill Opening.—In order to obtain uniform mixing, it is essential that the relation between volume of batch and mill opening be such that an active bank will obtain. Since it is neither practical nor economical to standardize the size of the batch, it is recommended that the following mill openings be used with batches corresponding to the volume in the table:

Vol. of Batch	*Distance between Rolls*
1200 cc.	.170 inches
1100	.160
1000	.145
900	.130
800	.120
700	.110
600	.100
500	.085
400	.070
300	.055

Batch Weight Tolerances.—Weighing of all ingredients shall be accurate to within 0.25% of the weight specified. The final weight of the mixed batch and the sum of the weights taken of each ingredient shall not differ by an amount exceeding 0.6% with a compound batch or 0.3% on master batched or gum stocks.

Mixing Procedure.—During the period of breaking down the rubber the mill opening shall be .055" until the rubber runs smooth on the roll. The opening should then be made to correspond with the volume of the batch in the foregoing table.

The order of adding ingredients to the broken rubber shall be as follows:

Accelerators and anti-oxidants
Black
Fillers
Softeners
Sulphur

The ingredients should be incorporated as rapidly as possible. After the ingredients are in the rubber, it is recommended that the rubber be cut 6 times, alternating first from one side and then the other. This is to be interpreted as cutting 2/3 of the way across

PHYSICAL TESTING COMMITTEE
(Rubber Division, A. C. S.)

Binney & Smith Co.	D. F. Cranor
Boston Woven Hose & Rubber Co.	T. M. Knowland
Bureau of Standards	P. L. Warmeley
E. I. duPont de Nemours & Co.	O. M. Hayden
Firestone Tire & Rubber Co.	F. D. Abbott
Fisk Rubber Co.	E. W. Fuller
B. F. Goodrich Co.	A. W. Carpenter
Goodyear Tire & Rubber Co.	
Raybestos-Manhattan, Inc.	W. L. Sturtevant
United States Rubber Co.	N. G. Madge
R. T. Vanderbilt Co. (Chairman)	A. A. Somerville

the roll and holding until the bank just disappears. After the six cuts are made, it is recommended that the batch should be cut across and rolled six times with the roll being inserted endwise each time until the last when it should be placed lengthwise in the rolls. As soon as the bank is well balanced after this procedure, the rolls should be set to give a sheet approximately .085 inch in thickness after cooling, and the batch cut from the rolls.

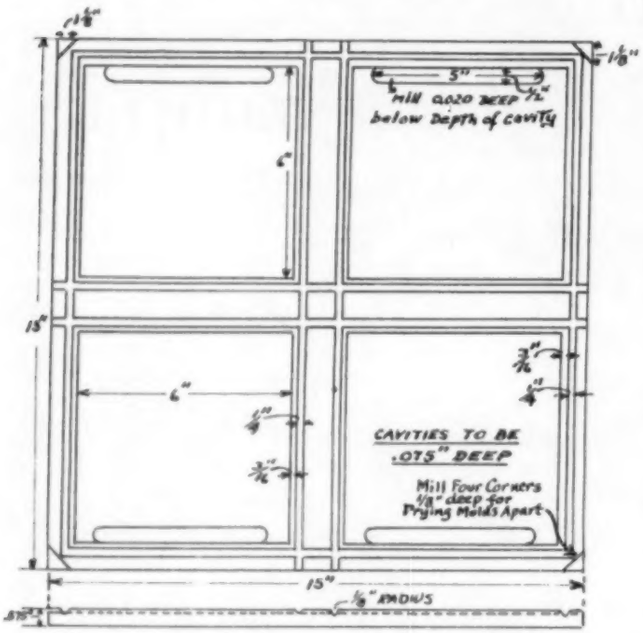


Figure 1—Design for Four Cavity Mold (Cover Plate to be 0.50" Thick)

Storage of Mixed Batch.—When cut from the rolls, the rubber compound should be laid flat upon a suitable surface (zinc, holland, talced zinc make no difference in final results) until it reaches room temperature. After cooling it may be stacked with similar batches for several hours for convenience, but for from 18 to 24 hours (either uncut or cut for curing) it should be placed on galvanized wire screens (6 mesh is convenient) to insure air circulation before curing. The storage shall be in subdued light in air having a relative humidity of 45 per cent. at 82° F. (27.6° C.). (*Variations from 0 to 100% relative humidity may cause a difference of 25% in physical properties.*)

Preparation of Raw Stock for Curing.—The uncured stock shall be cut with a die which will give an uncured slab 1/8" less in length and in width than the corresponding dimensions of the mold cavity. The raw slabs shall be placed in the mold with the grain running parallel to the stencil.

Maintenance of Curing Temperature.—The specified curing temperature shall be interpreted as the inside temperature of the mold as near as it can be determined by means of a thermocouple of a mercury thermometer in a mercury well in the mold. For this can be substituted a steel block with a mercury well as described in *Ind. and Eng. Chem.*, Vol. 17, No. 5, page 535, May, 1925, in a previous report of the Physical Testing Committee.

It is recommended that to avoid cool spots in the platens due to condensed moisture, presses of the bored platen type be used. If platens of the chamber type are used, particular attention must be paid that good drainage be insured by placing the steam outlet pipe so that it is slightly below the bottom of the steam chamber.

Timing of Cure.—When using a platen press, the time of the cure shall start from the time the hydraulic pressure reaches its maximum and conclude at the release of the hydraulic pressure. The slabs shall be removed from the mold immediately after the conclusion of the cure.

Mold Dimensions.—The depth of the cavity for the rubber slab shall be .075 inch. The thickness of the steel mold under the cavity and the thickness of the cover plate shall be .50 inch. The mold shall be of such dimensions that the slab while curing shall not be nearer than three inches from the edge of the platen. A drawing for a recommended mold is shown in Fig. 1.

Temperature of Molds.—The mold shall be brought to temperature before inserting the uncured stock by being placed in the closed press for a period of not less than 20 minutes.

Shielding of Molds.—During the curing the molds shall be protected from draughts by the use of wooden ells or shields of some sort. (*Protection often causes a rise of 1° C. in temperature of mold.*)

Cleanliness of Molds.—No preparation of any sort shall be used on the molds to prevent sticking. The molds shall be kept clean and it is recommended that they be cleaned as soon as there is a tendency of the cured stock to stick.

It is suggested that the molds may be cleaned, using any one of the following:

(a) Ground emery and water;
(b) Buffer cloth;
(c) Whiting paste.

Cooling of Cured Slabs.—When the slabs are removed from the molds they shall immediately be placed in water to cool for a minimum time of ten minutes. This water, if kept in a retainer, should be changed frequently to prevent contamination. When removed from the water, the slabs shall be wiped dry and placed upon a liner or wire screen for storage in subdued light.

Dieing of Specimens.—When the specimens are cut, it is recommended that the die or the stock be wet with water. Any residual water shall be wiped from the test pieces before conditioning for testing.

Standard Die.—The die used shall be the one illustrated in Fig. 2. The width of the constricted portion of the die shall be 0.250± .005 inch and great care shall be taken when the die is resharpened that these dimensions are maintained. It is essential that the cutting edge of the die be kept sufficiently sharp and free from imperfections so that the died specimen may have a smooth cut surface with a minimum of concavity.

Conditioning for Testing.—The test specimens shall be conditioned for 24 hours in air with a relative humidity of 45% at 82° F. (27.6° C.) before testing at the same temperature.

Measurement of Test.—In measuring the thickness of a test specimen, the diameter of the presser foot shall be 0.25 inch, and it shall be actuated by a dead weight of 3 ounces. The average thickness of the specimens in the constricted portion shall be used in the determination of the stress-strain relation and the tensile at break. The width of the test specimens shall be considered as the width of the die.

Bench Marks.—Bench marks, 1 inch apart, shall be placed near the center of the restricted portion with an instrument as illustrated, and used for determining the per cent elongation.

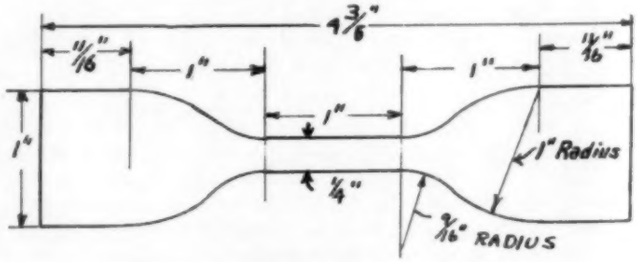


Figure 2—Die for Rubber Testing

Temperature of Testing.—The testing shall be done at a temperature of 82° F. (27.6° C.) and this should be controlled within plus or minus 2 degrees. (*A variation of 1° C. may cause a 1% difference in tensile or modulus.*)

Speed of Testing.—The testing shall be done with a machine which stretches the specimen at a speed closely comparable to that attained by using a Scott Tester whose lower grip travels at the rate of 20 inches per minute. (*Slight errors may be caused by varying this speed.*)

Evaluation of Results.—Breaks which occur outside of the straightaway portion of the specimen shall be discarded. In recording the final tensile of a compound obtained by three or more individual tests, it is recommended that the highest figure, and those that come within five per cent of this value be averaged discarding those results which vary more than 5% from the highest tensile figure.

Toxic Substances *in the* Rubber Industry

PART VII

By **P. A. DAVIS, A.B., M.A., M.D.**

Assistant Medical Director, Goodyear Tire & Rubber Company

ZINC *and* ITS COMPOUNDS

THERE has been much controversy during the past few years as to the toxicity of zinc and its compounds. For years such conditions as zinc ague, zinc asthma and zinc chills have been assigned to zinc workers and especially those working with zinc ores and in the smelting processes. Some investigators even describe acute zinc poisoning, while others are firm in stating zinc is non-poisonous, and chronic zinc poisoning is unknown.

Recently it has been shown that inert non-toxic substances can produce the same pulmonary conditions as the insoluble zinc compounds. Any substance may produce acute symptoms if taken in over-doses, but the symptoms may be due to one of a mechanical nature and not to the absorption and systemic distribution of the substance. The basic elemental substance may be non-toxic and even most of its compounds may be more or less inert, while one salt, especially a soluble one may produce some acute symptoms.

In discussing a substance like zinc it is well to know what the most common preparations are and what the nature of the element may let us conclude as to the action expected.

The most common zinc compounds used in commerce, are:
Zinc Oxide, Zinc Sulphide, Zinc Carbonate, Zinc Stearate, Metallic Zinc, Zinc Chloride, Zinc Sulphate, Zinc Silicate.

The largest number of cases described as being zinc poisoning are among miners and smelters, but I believe this condition is due not to zinc but to its associated metals, lead, arsenic, cadmium, manganese and perhaps chromium.

Zinc oxide, stearate, sulphide, carbonate and metallic zinc are used extensively in the rubber industry. All men working with these preparations have been examined every 6 months for the past 15 years and we have not found any condition that may be caused by zinc absorption. It may, however, be possible for a condition to develop from inhalation of the powder and dust similar to silicosis, but this could happen with any insoluble compound so it cannot be attributed to zinc. Of all the substances used above zinc stearate, in one case has caused a severe nasal and throat inflammation. There has been several instances where insufflation pneumonia has resulted from the inhalation of zinc stearate. This is perfectly possible for some decomposition takes place and produces some solubility of the zinc which initiates the inflammation. This can be caused by other powders as well as this one. Repeated inhalation of zinc stearate may produce a pulmonary fibrosis and so may many other powders. I do not believe that a pure insoluble compound of zinc such as the oxide and carbonate would be any more at fault than soapstone in producing this condition. It is not due to the toxicity of the zinc but to the mechanical factor involved.

Repeated examinations of the blood of men who have been working in the compound rooms handling zinc oxide and carbonate do not show any changes to have taken place. Zinc chloride and zinc sulphate are caustics, astringents and if taken in small amounts will cause nausea and vomiting and if vapors are inhaled will cause coryza and a bronchitis, however, in dilute solutions, they are both used as medicines in certain eye solutions and gargles for the throat. In these two compounds again we deal with the type of combination which makes the salt a very soluble one and the acid radical combination is very strong. I am of the opinion that the action of these two substances is purely local and not systemic because the human system reacts very readily to astringents and escharotics and throws out a protective wall and in this case a zinc albuminate is formed or due to the fact that zinc is an amphoteric element a zincate may be formed.

The modes of absorption is almost entirely limited to the respiratory and alimentary system.

In making a diagnosis of zinc poisoning one will find that it is much easier to do so by a process of elimination of perhaps the true cause of the condition. The following possibilities should be eliminated.

1. Lead
2. Arsenic and antimony
3. Manganese
4. Cadmium
5. Chromium
6. Dusts and fumes containing any of the above
7. Onset of La Grippe, tonsilitis or acute pulmonary conditions.

The most common symptoms which previously have been ascribed to zinc are as follows:

1. Dryness and irritations of nose and throat.
2. Irritation of eyes from fumes.
3. S1 Bronchitis, with heavy feeling in chest.
4. Nausea with metallic taste in the mouth.
5. Headache, lassitude.
6. Chills with rigor.
7. Muscle cramps.
8. Occasionally severe vomiting.
9. In the case of the chloride and sulphate, blisters, burns and ulcerations.

The methods of elimination are almost entirely limited to the intestinal urinary tracts. Small amounts of zinc may be normally present in the excretions of the body as a certain small percentage of zinc is essential for the body tissues. There have been several cases of pneumonia reported in infants as the result of inhalation of zinc stearate. I do not believe this was caused by the zinc element of the compound, but rather to decomposition products of the stearic acid radical which will produce an irritation. Any other substance of similar composition might produce the same condition.

Of all the substances used in the rubber industry we are less concerned with zinc than any of them, as we consider zinc and its compounds non-toxic and the only ones that we issue warnings against are the soluble zinc chloride and sulphate, for these in solutions cause burns and blisters and occasionally a dermatitis.

However, with all powdered substances, zinc and its compounds are handled in closed systems, just as soapstone, iron oxide and others, not because they are toxic but on account of the dust factor. We must in all cases where zinc or its compounds are being used in combinations with lead, arsenic, manganese, cadmium and chromium or where brass is being used exert the utmost precautions for a condition is most likely to develop that is caused by the other constituents. Metal fume ague is not due to zinc as an element, but to associated elements and gases formed by combustion and oxidation.

Large amounts of insoluble zinc salts can be taken over a period of time and simultaneously large amounts are excreted through the

intestinal and urinary tracts, some passing through the intestinal tract unchanged.

Much work has been done by the Harvard School of Public Health on zinc and its compounds and they are of the opinion that zinc is non-toxic.

Unlike lead, zinc is excreted in large amounts and does not enter into bone combination. This may account for the non-toxic properties, for the larger the amount of zinc taken into the system the greater the amount excreted. Occasionally some complaint is made when using commercial products, but none has ever been made when chemically pure substances are involved. Some metallic zinc of commercial varieties may contain some sulpho-bodies and produce hydrogen sulphide in their usage, especially when zinc is used in the plating process, the galvanizing processes, or where zinc is used by electric welders. However, this is no fault of the zinc and should not be attributed to it, but to the responsible offender.

Conclusions

1. Experience and observations have shown that zinc (metallic) and its insoluble compounds are nonpoisonous.
2. Some of the soluble salts such as the chloride and sulphate are caustic and will produce burns and a dermatitis.
3. The soluble salts of zinc if taken in average amounts may cause nausea and vomiting.
4. That most cases of so-called zinc poisoning is not due to zinc, but to its associated elements, lead, arsenic, antimony, etc.
5. That chronic zinc poisoning is not known.
6. That the so-called acute poisoning is not characteristic of zinc and may be caused by many other substances.
7. That examinations of several hundred men working in zinc compounds has not shown any definite blood changes or any systemic effects.
8. That certain insoluble zinc compounds, namely, the stearate, has produced pneumonias, but this is not due to the toxicity of the zinc but to the mechanical factor and the irritation caused by the acid radical in combination with the zinc.
9. That processes using insoluble zinc compounds where there is a commercial possibility of lead, arsenic, antimony, cadmium, chromium and manganese being present should be handled carefully, for these impurities will cause poisoning.
10. All processes using commercial zinc or its compounds where there is a possibility of fumes being generated should be adequately ventilated in order to reduce the hazard caused by impurities.

Utilizing Air Service in the Rubber Industry

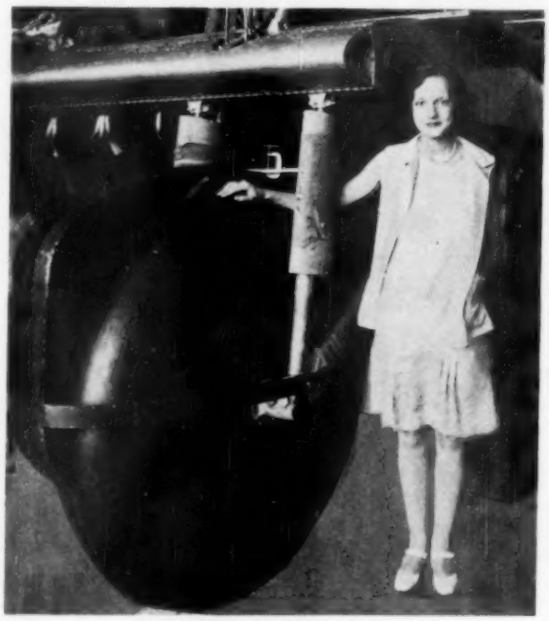
Not only is the rubber industry interested in the airplane as a market for its product, but air mail and express are being utilized by the industry to speed up business, and extend markets.

The air mail companies report that rubber concerns are using air mail for handling of all correspondence between offices where a saving in time can be made over train mail; announcements about new products; soliciting new accounts; in place of night telegrams (with special delivery stamp also); save interest charges on funds in transit; rush shipments of samples and "out of stock" merchandise; emergency shipment of spare parts; mail requiring Saturday morning delivery instead of Monday delivery by ordinary mail; collecting slow accounts; price quotations and specifications; maintaining closer contacts with branch offices and salesmen; all form and important communications to agencies, dealers, jobbers, customers, etc.; and filing of tracers by traffic department. Air mail averages 100 miles an hour and also goes on a "bee line" while train mail averages 35 miles an hour and trains must detour for rivers, mountains and obstructions.

The Boeing Airplane Company, for instance, has just produced a fleet of 18-passenger tri-motored planes, some of which will be placed on the Chicago-San Francisco route in the spring, operating on a 20-hour schedule.

The airplane tires used by the Boeing Airplane Company transport as illustrated above are 54 x 12. On the mail cargo single engine planes 36 x 8 8-ply tires are used. Six-ply tires would not stand up under the hard wear imposed by rough fields, while ten ply were too rigid.

The tires are only incidental in the use of rubber in airplane manufacture. There is rubber matting for the cabin



Airplane Tires Used on Tri-Motored 18-Passenger Planes, Built to Withstand Landing Impact of 43 Tons

floors, packing for windshields, rubber grommetts in fire walls, and for the navy planes balloon-like bags put in the wings to keep the plane afloat should it be forced down when out at sea.

In the radio department recently discovered interesting uses for rubber have been made in connection with the radiophone development. With the radiophone it is possible for pilots to talk from an altitude of 12,000 feet to ground stations as distant as 200 miles, but before the experiments were successful it was necessary to reduce static, vibration, and other ills which affected radio broadcasting reception, and here again rubber was a strong ally of the engineers.

Rubber is used not only in the sets in the planes but in the ground station sets which are installed between Chicago and San Francisco.

Tires, propeller covering, hose, rubber matting, shock absorbers, aero board, tail wheels, pontoons, hand-hold covers, handle grips, are only a few of the items being furnished by the rubber manufacturers.

Fellowships in Rubber Chemistry

THE University of Akron has announced that it will offer three graduate fellowships in the study of rubber chemistry during the academic year 1930-31, to students who have shown outstanding ability in the field of chemistry during their undergraduate work. The fellowships pay $1,000 each and exempt the holder from all fees and deposits. These fellowships have been made possbile by the Goodyear Tire and Rubber Company, The B. F. Goodrich Company and the Firestone Tire and Rubber Company. At the present time, there are six graduate students in the department of rubber chemistry of the University. Any one interested should apply to Dr. H. E. Simmons, Professor of Chemistry, University of Akron, Akron, O., for information and application blanks.

Schaphorst's CHATS *with the* ENGINEER

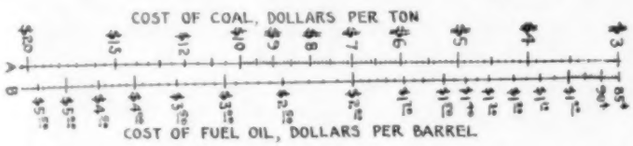
By W. F. SCHAPHORST, M.E.

When Does Oil Burning Cost Less Than Coal?

THE question is commonly asked by officials of the rubber plant, "Will it cost less for us to burn oil than coal?" I have therefore prepared this little chart which answers the question roughly at a glance.

Find the cost of coal in dollars per ton in Column A and then glance across to the opposite figure in Column B and you have there the equivalent cost of fuel oil in dollars per barrel. Thus, if coal in your vicinity costs $7.00 per ton, that price is equivalent to about $2 per barrel for fuel oil.

If you can buy fuel oil at $1.70 per barrel the chart also shows that you will be saving a little over $1 per ton



of coal. Or, if you can buy fuel oil for $1.50 per barrel you will be saving about $1.70 per ton of coal, based on the $7.00 rate.

On the other hand, if coal costs $5 per ton and fuel oil $1.50 per barrel, the chart shows that from the standpoint of cost of fuel it will not pay to burn oil instead of coal. It is necessary to buy fuel oil at a cost of $1.43 per barrel in order to make it the equivalent of $5 per ton.

There are other things that must be considered, of course, in addition to mere first cost of fuel. There is the cost of oil burning equipment, storage tanks, piping, and so forth. Such costs are obtainable from the manufacturers of oil burning equipment themselves. It is impossible to put these factors into a chart of any kind because they are so variable. No two plants are alike. Conditions are always different. Frequently the added cost of oil burning equipment is the deciding item.

And then there is the value of time saved which must be credited to oil burning. A boiler can be put into operation more quickly if oil is burned. When it is necessary to shut down, the heat may be shut off instantly. It is sometimes necessary to "pull" coal fires, which is neither necessary nor possible where oil is burned. The costs and losses due to banking fires are obviated where oil is used. The cost of removing ashes and the investment in equipment for ash handling are saved. A further saving as compared with the use of coal is to be found in the payroll. A prominent burner manufacturer states that with oil burners two men can do the firing which with coal would probably require nine men. A few pumps do away with a large number of stokers, ash handlers, etc. After adjustments are once made, the human factor is less important than in coal firing, and because many high-grade engineers prefer oil burning to coal it is often possible to obtain a better engineer at the salary paid.

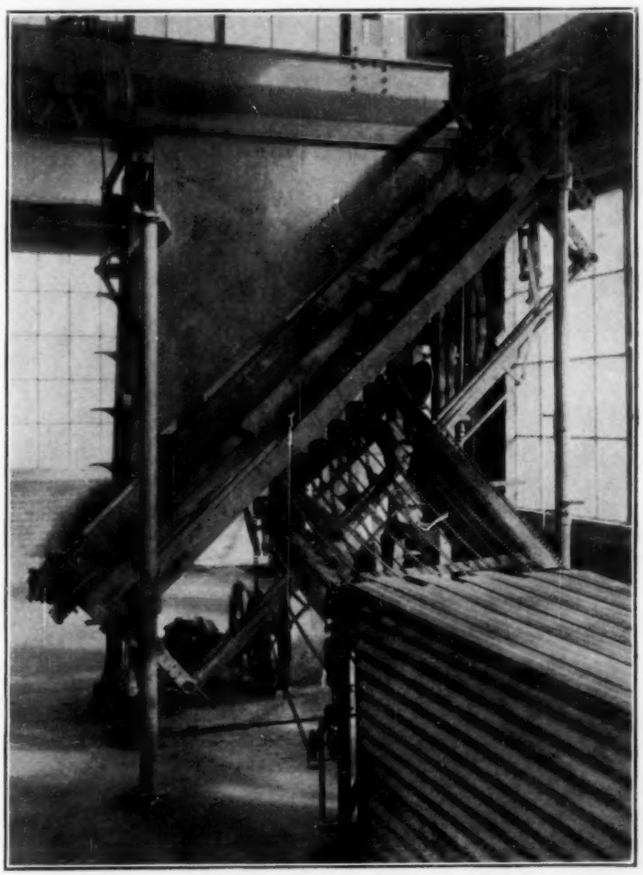
But, notwithstanding all of the above facts and many more upon which I shall not touch in this article, the most important question usually is, Which provides the greater amount of heat per dollars, oil or coal? My little chart, herewith, gives the answer.

Improvements Made on Bolton Cutter

THE Spadone Machine Company, 15 Park Row, New York City, have recently developed several improvements in the Bolton Bias Cutter, which is used in all leading tire plants in the United States and foreign factories. These new improvements are not only incorporated in the new model machines but they can also be applied to all Bolton cutters already in use.

The former single blade reciprocating knife is replaced by a new cutting arrangement consisting of a continuous running endless chain carrying several cutting knives. This is one of the most important of the new features and not only makes the machine run with increased speed and smoothness and produces cleaner cut work, but it also tends to eliminate the inaccuracies occasioned by the pull of the old single knife cutting.

A second improvement of importance is the link belt conveyor system so arranged that it will remove the fabric



Improved Model of the Bolton Bias Cutter

cuts of any width or angle and discharge them, as rapidly as produced, onto a horizontal conveyor from which the cuts can be spliced into continuous lengths or made into the usual "pockets" as required.

A further improvement is in the method of supplying the fabric to the feed roller and practically eliminates the possibility of any inaccuracy of cutting due to defects in calendering or in the weave of the goods.

The new machine can be handled by one man with a consequent saving in cost of operation.

The accompanying illustration shows the improved machine from its delivery side, with the new link belt conveyors descending to the horizontal conveyor. The latter comprises a number of narrow rubber belts operating in union on top of the bench boxed in at the sides with corrugated sheet metal.

EDITORIAL COMMENT

JUST when the industry has enjoyed its first year of free trading in crude rubber the plantation interests are again talking "restriction." It would certainly seem, in this matter, that the old adage about the "burnt child dreading the fire" should apply, but apparently not. This time not only is there a new infant in the game, in the form of the Dutch growers, but the one "old enough to know better" is getting perilously near to being scorched again. One wouldn't play with the other one last time and the game ended tragically. There is very little likelihood of them joining together in the game this time, so that the same element of probable tragedy still persists.

Restriction Again?

The Dutch scheme as formulated to apply to production in the Dutch East Indies calls for a restriction of from 10 to 20 per cent of the outputs of both native and European producers, and it is reported that a committee formed in cooperation with British producers engaged in planting in the Dutch East Indies will leave for Java shortly to study the question. Under the plan the European producers will deposit 20 florins per ton and the natives 2 cents per kilogram, which will be forfeited in the event of non-fulfillment of the obligations. The enforcement of such a plan with the native growers as the uncontrollable factors, would present difficulties somewhat akin to those encountered in the administration of our own prohibition legislation.

The British scheme, as outlined by the recommendations of the Rubber Growers Association, proposes an equally mythical plan as regards its effective enforcement, under which smaller groups of estates are asked to combine into larger units for the purpose of "cooperative selling" through a "super central selling agency," which would purchase a part of the output of the estates to be held for advantageous prices in the markets, the delusive idea being that by holding back a proportion of Malayan output, an artificial market could thus be created which would improve the price.

On their face, both schemes would appear impossible of effectual operation, or, at least, could not hope to remedy the situation for which they are intended. For one thing, two schemes so utterly unlike cannot successfully operate in separate areas without detriment to one area at the expense of the other. The surprising thing is that they are being taken seriously by not only the producing interests but by crude rubber traders and manufacturers as well. One restriction debacle should have proved a lasting example.

IT is seldom that any industry, and particularly the rubber industry, is treated to a heart-to-heart talk, full of hard hitting thrusts and pointed gibes, such as was given by the retiring president of the Rubber Manufacturers Association, F. A. Seiberling, on the occasion of his last appearance as presiding officer at the annual banquet in New York on December 6 last. It was a speech, which though delivered extemporaneously, must have been in the back of his head for a long time, and thus found a most opportune and dramatic time for deliverance.

The Unpleasant Truth

He minced no words when he said that the industry was "handling the rubber business without rhyme or reason," and that in merchandising practices "they were like wolves in the jungle." He rebuked the industry for creating competitive conditions whereby bulk tire sales were made at cost or below cost in order to get the business, and declared that such selling practices were "dishonest." His criticism of the policy of employing large numbers of men for a limited seasonal production drive and then throwing them out on the streets to hunt other jobs, was no less denunciatory in its terms and language Calling attention to the present economic situation throughout the country and the desirability for stability in production over wide periods of operations rather than conditions which produce peaks and depressions, prosperity and distress, he urged greater cooperation and coordination within the industry to bring about a more even and consistent trend in production. Nor was he afraid to declare that the industry, though sound fundamentally, was not sound in its leadership and placed the responsibility of the present situation within the industry on that very lack of leadership.

Withal, it was a notable speech and can well be taken to heart by the industry. Much good can come from a study of his criticisms and from his constructive suggestions for more unity within the industry, a more virile leadership, a more sane production scheduling, and a more honest competitive merchandising policy.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

INTERNATIONAL SHOE CO. ENLARGES RUBBER PLANT

Preliminary work on the erection of a new two-story addition to the rubber plant of the International Shoe Company at Hannibal, Mo., has been started. The new building, which will replace an old one-story concrete building, will be 68 by 200 feet in size and of brick, steel and concrete construction. It will cost approximately $75,000.

The International Shoe Company, which operates two large shoe factories in Hannibal, established its rubber heel plant there in 1925 and during the past year the plant produced 34,000,000 pairs of heels and more than 8,000,000 pairs of soles. The new addition to the plant will be the third since 1925 and will bring the company's rubber factory investment at Hannibal up to $225,000.

CABOT WILL INCREASE CARBON BLACK OUTPUT

Godfrey L. Cabot, Inc., Boston, Mass., produced a total of 70,678,091 pounds of carbon black at its several plants during 1929 and is planning to increase this output to approximately 100,000,000 pounds in the present year. Last year the company completed plants at Pampa, Skellytown, Kingsmill and Stinnett, Tex., and at Lima, Okla.

Commenting on the situation in the industry, the company states, "The last two years have seen a tremendous expansion in the producing facilities of the carbon black industry, with the consequence that there has been some accumulation of stocks last fall and a lower market price. The use of carbon black has shown remarkably consistent growth for many years and it is our opinion that consumption in 1930 will slightly exceed consumption in 1929. No further expansion of producing facilities will be necessary during the year to meet any probable demand."

ACCIDENTS AT GOODYEAR REDUCED 52.4% IN 1929

Employes of the Goodyear Tire & Rubber Company made a reduction in lost time accidents in 1929 of 52.4 per cent over 1928, according to the safety department of the company. This follows a reduction of 35.1 made in 1928 over 1927.

The safety plaque for divisions was won by L. B. Tomkinson's squadron division which made the outstanding record of seven months without accident. This division has 647 employes.

The Goodyear safety department has set for 1930 a goal of 25 per cent reduction over 1929.

SWAIN IS NAMED HEAD OF GOODYEAR RIM SALES

J. G. Swain, former vice-president of the Firestone Steel Products Company, rim manufacturers, has been made head of the rim sales department of the Goodyear Tire & Rubber Company. Mr. Swain, organizer of the Firestone Steel Products Company, was instrumental in the development of the manufacture and sales of rims for that company in all departments of the rim business.

He was 13 years with the Firestone organization, is an engineering graduate of Purdue University and brings to his new duties not only years of experience in rim making and distribution, but an excellent knowledge of the market and acquaintanceship among truck and bus manufacturers.

J. G. SWAIN

R. S. Burdette, former manager of rim sales, becomes assistant manager of the department, and will continue in his activities in the field on rim sales.

No Wage Cut at Firestone

There will be no reduction in wages at the Firestone Tire & Rubber Company during 1930, according to the Massachusetts State Industrial Commission which has received word to that effect from the tire company. The letter from Firestone was one of many received in answer to an inquiry sent out a short time ago at the suggestion of Governor Frank G. Allen to large utility and industrial companies.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, has been elected to the board of directors of the Monarch Fire Insurance Company.

RUBBER FIRMS RESUME BUSINESS IN CARROLLTON

The rubber businesses of the Pretty-Scheffer Rubber Company and the Tuscan Tire & Rubber Company, both of whose factories at Carrollton, O., were destroyed in a $150,000 fire on October 29, will be resumed in the near future. The Pretty-Scheffer Company has taken over the first and second floors of the factory building of the Surety Rubber Company and will proceed as soon as these quarters are remodeled and new equipment installed. Production of rubber gloves by the company is scheduled to start again this month.

The Tuscan Tire & Rubber Company, however, is being succeeded by a new company, which will manufacture rubber gloves, bathing caps, rubber corks and miscellaneous articles. A new one-story brick building will be constructed on the site of the old Tuscan factory, and an issue of $25,000 first mortgage 6 per cent bonds is being floated to provide funds for this structure.

UNITED STATES RUBBER OFFERS NEW TIRE LINE

Introduction of a new 1930 line of U. S. Royal heavy service tires was announced as of Jan. 15 by the United States Rubber Company. The new line comprises a wide range of high pressure and balloon tires to meet every need of the commercial transportation field.

At the same time the company also announced the widening of its line of solid industrial tires for use on electric trucks and other interior conveyances by the addition of a large number of sizes.

The tread design of the heavy service tire consists of a central rib flanked on each side by rows of large, sturdy blocks. The outside rows of blocks are further strengthened by heavy buttresses of rubber at the tread shoulder.

Advantages claimed for the new tire over last year's line include deeper tread grooves to increase the non-skid life of the tire; greater uniformity of tread wear—no cupping; wider tread for increased mileage, traction, and safety; easier riding and maximum vehicle cushioning due to the deep tread grooves, large air volume and carcass profile; easier rolling with consequent reduction in "drag" and power consumption; better sidewall protection, and improved appearance.

Harshaw Chemical Akron Office

The Harshaw Chemical Company, Cleveland, O., has opened an office and warehouse at 309 Silver street, Akron, O. The new office will be in the charge of Russell Farley.

GOODYEAR GADSDEN PLANT WILL INCREASE OUTPUT

The tire plant of the Goodyear Tire & Rubber Company at Gadsden, Ala., is reported to have jumped its daily production this month from 4,000 to 5,000 tires. By adding 400 men to the 1,000 already employed it will be producing 7,500 tires daily by April 1.

The rubber reclaiming plant which has been reclaiming 15 tons of rubber from used tires daily has increased that rate to 25 tons daily, and will employ additional men to care for the increased production. It is expected that the Goodyear tire plant will have a payroll of $2,000,000 annually by April 1.

79th A. C. S. Meeting

The 79th meeting of the American Chemical Society will be held at Atlanta, Ga., from April 7 to 11. Sessions of the Rubber Division will be held during this period.

Automotive Shows at Cleveland

The Motor and Equipment Association and the National Standard Parts Association have completed plans to hold their annual conventions and shows next fall in the same place and during successive weeks. The Public Auditorium at Cleveland, O., has been selected for both of the 1930 shows. During the week of November 10, the show of the Motor and Equipment Association will be conducted, and the National Standard Parts Association will follow during the week of November 17.

A. S. T. M. Meeting in Detroit

The first regional meeting to be sponsored by the American Society for Testing Materials will be held at the Book-Cadillac Hotel, Detroit, Mich., on March 19. A technical program has been arranged in the form of a symposium on developments in automotive materials. The morning session will be devoted to metals, but in the afternoon there will be a talk by Walter C. Keys, chief engineer of the automotive development department of the United States Rubber Company, on "Advances in Rubber for Automotive Use" and other papers on miscellaneous materials. The meeting will close with an informal dinner.

Textile Committee to Meet

Members of Committee D-13 on Textile Materials of the American Society for Testing Materials will hold their next meeting at Charlotte, N. C., on March 13 and 14. This committee has been reorganized and now has two groups of sub-committees. A sub-committee in Group "A" deals with a single fibre (or group of related fibres) and its fabrications, while a sub-committee in Group "B" deals with matters relating to more than one fibre as methods of test, machines, finishing, etc. The Group "B" committees also act in a reviewing or correlating capacity on matters originating in the "A" group.

Walter B. Bainbridge

Walter B. Bainbridge, former vice-president and general sales manager of the Essex Rubber Company, Trenton, N. J., died on January 11 at his home in Philadelphia. He became associated with the Essex Rubber Company at the time the firm was formed 23 years ago, and he was a pioneer in promoting the use of rubber heels and soles by shoe manufacturers.

Mr. Bainbridge, who was 75 years old, was born in Mount Holly, N. J., but lived in Winthrop, Mass., until his health necessitated moving to a milder climate five years ago. He was formerly commodore of the Cottage Park Yacht Club at Winthrop. In addition to his widow, two daughters survive him.

Sam A. Rowe

Sam A. Rowe, who was secretary-manager of the National Tire Dealers' Association during 1926 and 1927, died in a Chicago hospital on December 27, after an illness of several months. Born and educated at Christiania, Norway, he came to America when 20 years old, worked for several years as secretary to Dr. Kellogg, health expert of Battle Creek, Mich., and entered the tire business as a Chicago representative. Later he went to Milwaukee, Wis., where he conducted a retail tire business for several years.

Rubber Firm Incorporated

The National Rubber & Salvage Company, 1532 Mack Avenue, Detroit, Mich., was incorporated early this month with a capital of $5,000. The new firm will engage in the scrap rubber business.

Form Rubber Doll Company

Articles of incorporation have been filed at Trenton, N. J., by the B. N. B. Novelty Company, which has been organized to manufacture a newly patented rubber doll and other rubber articles. The new company has 10,000 shares of capital stock of $10 par value, and the incorporators are William Wolfe and Libby Cohen, of Philadelphia, and M. E. Scales, of Trenton. The rubber doll to be manufactured was invented by the late C. Francis Fisk, former owner of the Fisk Flap Tube Rubber Company, Yardville, N. J.

KELLY-SPRINGFIELD SAID TO BE IN GOOD CONDITION

T. S. Lindsey, vice-president and sales manager of the Kelly-Springfield Tire Company, has sent a letter to managers, office managers and salesmen of the company, stating that the organization closed the year 1929 in excellent financial condition. He further stated that Kelly had been able to retain all of its original equipment accounts.

According to Mr. Lindsey, the ratio of current assets to current liabilities on December 31, 1929, was between 14 and 15 to 1. The company on that date had no bank loans outstanding.

PIONEER RUBBER COMPANY RESUMES ITS DIVIDENDS

The Pioneer Rubber Company, Willard, O., manufacturer of surgeons' gloves and toy balloons, has resumed dividends on its $300,000 worth of 7 per cent preferred stock by making a quarterly payment, the first since 1923. There has been no dividend declaration on the company's common stock.

J. C. Gibson, general manager, stated that the gross earnings of the company had been in excess of twice the dividend requirements, but that the additional profits had been held as surplus. This plan had been employed by the company in recent years, he said, and had enabled it to stand the heavy increase in the price of crude rubber during 1925.

Firestone on Cleveland 'Change

The new stock issues of the Firestone Tire & Rubber Company, both of which were listed on the New York Stock Exchange late last year, have also been admitted to listing on the Cleveland Stock Exchange. Trading was started on January 13 in these issues, which include 2,250,000 shares of $10 par common stock and 600,000 shares of 6 per cent cumulative convertible preferred stock of $100 par value.

Stedman Pays Dividend

The Stedman Products Company, South Braintree, Mass., manufacturer of rubber flooring and other rubber products, paid its 45th consecutive quarterly dividend of $1.75 per share on the company's preferred stock on January 2. The dividend was paid to all stockholders of record at the close of business on December 26, 1929.

Rubber Stocks Action Mixed

Declines have been more prevalent than gains among stock issues of rubber manufacturing companies during the past fortnight. Following the Goodrich offer, Miller Rubber preferred jumped from 18 to a high of 31¾. Raybestos-Manhattan has also acted well, rising from 33 to 39¼. The prices of leading rubber company securities on January 21 compare as follows:

	Last Price		High	Low
	Jan. 21	Jan. 4	—1930—	
Ajax	2	1⅞	2½	1⅞
Falls	—	—	—	—
Faultless	—	—	35	34⅝
Firestone	31	30	33¼	29¾
do. 6% pfd.	83⅜	86	86⅜	83
Fisk	3¼	3⅛	3½	3
do. 1st pfd.	15½	14¼	16⅛	13
General	—	—	150	150
do. pfd.	—	83½	91	88½
Goodrich	43¼	43½	45	40¼
do. pfd.	—	95⅝	95⅝	95⅝
Goodyear Com.	64½	65	67	62
do. pr. pfd.	93⅝	90⅛	94	90
India	—	—	11	10
Intercontinental	5	5¼	5⅜	4¼
Kelly Springfield	4⅝	3⅞	5½	3¼
do. 6% pfd.	39	32	39	29
Lee	—	6¼	8½	6¼
Miller	4½	4¼	4⅝	4
do. pfd.	31	18	31¾	18
Mohawk	8½	8¾	9¾	8½
do. pfd.	—	—	55	55
Norwalk	—	1	1	⅞
Pirelli	—	46⅜	47½	45
Raybestos-Manhattan	39¼	33½	39¼	33
Seiberling	14	10¼	16	10¼
do. pfd.	—	—	74	64⅞
U. S. Rubber	23	26⅝	27½	21⅛
do. pfd.	49½	52	52⅝	47¾

Names in the News

C. S. CHING, director of industrial and public relations of the United States Rubber Company, will preside over the morning session of the personnel administration conference on January 30 at the Hotel Statler, Cleveland, O. At the morning session on January 31, MISS E. H. LITTLE, assistant supervisor of industrial relations, United States Rubber Company, will speak on the topic, "What is the Dismissal Wage Policy of the United States Rubber Company and What Are Its Effects?" The conference, which will be held from January 29 to 31, is under the auspices of the American Management Association.

ARTHUR H. MASSEY, general sales manager of the Combination Rubber Company, Trenton, N. J., has resigned to accept a position with the United States Rubber Company as regional sales manager of the North west district. He was formerly western representative for the Combination Rubber Company and was connected with that firm for many years.

A. H. MASSEY

DR. CHARLES BARTON, noted Pacific coast research worker, has been studying the presence of bacteria in the upper strata of air with the airship Volunteer through the cooperation of the Goodyear Tire & Rubber Company.

V. R. JACOBS, assistant manager of the aeronautics department of the Goodyear Tire & Rubber Company, spoke at Toledo, O., on January 15 before a joint meeting of the Affiliated Technical Societies of Toledo, the Foremen's Club and the Toledo Aviation Club. On January 8 he spoke before members of the Engineers Club of Dayton, O., and their guests, the local sections of the Society of Automotive Engineers and the American Society of Mechanical Engineers. Both his talks were on the subject of dirigible airships.

J. B. HALL, secretary of the Surety Rubber Company, Carrollton, O., acted as toastmaster at a dinner for the employes of the company on January 1.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, was the principal speaker at the meeting of the East Akron Board of Trade on January 13. He discussed the business outlook for 1930. On February 10, Mr. Litchfield will be the guest of honor at the monthly meeting of the Ohio Society in New York City. Other guests will include DR. KARL ARNSTEIN and J. C. HUNSICKER, vice-presidents of the Goodyear-Zeppelin Corporation.

L. D. ACKERMAN, chemist of the Converse Rubber Company, Malden, Mass., has left that organization to become associated with the footwear control laboratory of the United States Rubber Company at Naugatuck, Conn.

WILLIAM H. SAYER, JR., president of the Mercer Rubber Company, Trenton, N. J., has returned to his office from an extended business trip through the middle west.

F. L. RYAN, general sales manager of the India Tire & Rubber Company, has taken over the million-dollar franchise for the distribution of India tires and tubes in Los Angeles and surrounding territory. DEAN MOSHER, who has been associated with the former India tire dealer in Los Angeles, is to join Mr. Ryan in his entrance into the retail field.

EARL LANGSTROTH, publicity manager of the Rubber Manufacturers' Associaion, is recovering from an infected foot which had confined him to a hospital bed for several weeks.

MIAH MARCUS, treasurer of the Puritan Rubber Company, Trenton, N. J., has returned from a three-week business trip through Canada.

JOHN D. GILLIS, assistant to the president of the Monsanto Chemical Works and formerly president of John T. Milliken & Company, has been appointed to an executive position with the Graesser-Monsanto Chemical Works, Ltd., London, England. SAMUEL W. ALLENDER succeeds Mr. Gillis as assistant to the president of the Monsanto Chemical Works at St. Louis, Mo.

LEE SCHOENHAIR, piloting the Miss Silvertown plane of the B. F. Goodrich Company, made the trip from Akron, O., to Hartford, Conn., in two hours and 50 minutes early this month. He averaged better than 190 miles an hour for the 540 air miles of the trip.

F. ROBERT LEE, vice-president of the Thermoid Company, Trenton, N. J., sailed during the middle of January for a tour through Europe. He will visit the different Thermoid agencies on the Continent and will remain away several weeks.

ABRAHAM M. SAWYER, former general manager and superintendent of the Vulcanized Rubber Company, Morrisville, Pa., was given a testimonial dinner at Trenton recently. Mr. Sawyer was employed at the Vulcanized Rubber Company for 41 years before his recent decision to retire. Short talks were made at dinner by STANLEY H. RENTON, president of the company; JOSEPH MCLEAN, vice-president; and A. G. LINGLEY, comptroller.

LINDSAY C. MOORE, well known in Detroit tire and automotive circles, has been appointed as district manager of United States Rubber Company tire sales at Buffalo, N. Y. Mr. Moore, a native Detroiter, spent the past year with the Buick Motor Company in a marketing and sales research capacity, and prior to that was identified with the tire industry for ten years, five years having been spent as Detroit district manager for a tire manufacturer.

L. C. MOORE

LIEUTENANT T. G. W. SETTLE, Navy balloonist and airship expert, spoke before the members of the Shrine Club of Akron January 17, the subject of his talk being, "On the Graf Zeppelin with Dr. Eckener," Lieutenant "Tex" Settle, as he is popularly known, is one of the four Navy men in Akron to inspect the work done on ZRS-4 and ZRS-5 being built by the Goodyear-Zeppelin Corporation.

RALPH B. APPLEBY, formerly rubber chemist and Akron representative of the American Cyanamid Company, is now connected with the Thermatomic Carbon Company, Pittsburgh, Pa., producers of carbon pigments for the rubber, paint and ink trades. Prior to his employment by the American Cyanamid Company, Mr. Appleby was a member of the technical staff of the B. F. Goodrich Company.

Rubber News Around the World

BRITISH GOODRICH SALES CONTINUE TO INCREASE

At the annual meeting of the British Goodrich Rubber Company, Ltd., on December 30, Sir Walrond Sinclair, chairman, reported continued progressive increases in sales throughout each department, in spite of difficult unsettled economic conditions and the most intensive competition the tire department has ever experienced. "Although conditions are apparently becoming a little more difficult," he reported, "the sales volume during the past ten weeks has been maintained as compared with the corresponding weeks of last year."

Sir Walrond added that the plant and machinery at Leyland had been working at high pressure throughout the year, but has been maintained at maximum efficiency. "A number of modern improvements have been introduced during the past twelve months," he said. "Certain extensions necessary to widen the scope and increase the output of two departments are now being carried out, but consideration of the more comprehensive scheme for increased manufacturing facilities contemplated by the directors has necessarily been deferred owing to the regrettable uncertainty regarding general trading conditions at present prevailing.

"Development work, both as regards manufacture and salesmanship, is being carried out with gratifying results and promise for the future. It is the policy of the directors to extend the company's business upon a basis as broad as the general utility of rubber itself, and every technical advance is closely studied in its ultimate application with a view to maintaining the company in the first line of forward progress."

I. R. I. Annual Meeting

The eighth annual general meeting of the Institution of the Rubber Industry will be held on February 26. The meeting will be followed by a dinner in honor of the new president, Eric Macfadyen, a director of Harrisons & Grosfield and former chairman of the Rubber Growers' Association. The retiring president, Lord Colwyn, and other leaders of the industry will be present.

CATALPO
for
Inner Tubes

Old Tires Used as Shoes

In India, natives are glad to be able to obtain a pair of sandals made from discarded American automobile tires. One of the soles shown above was cut from the sidewall of a United States Royal cord automobile tire, and in order to get the required thickness the carcass down to the last ply was included. The other sandal of this pair was taken from the tread of a Royal cord heavy service, and because what remains of the tread is equal in thickness to the combined sidewall rubber and carcass fabric in the piece selected for its mate, no fabric is used.

MACFAYDEN SEES HIGHER CRUDE RUBBER PRICES

In the course of an interview at Kuala Lumpur, Selangor, Eric Macfadyen, a director of Harrisons & Crosfield, has expressed the opinion that the rubber market has now probably touched bottom and that it might not be long before the year 1930 saw an an active market with rising prices.

"A few years from now," Mr. Macfadyen added, "and it is quite likely that, instead of the United States taking some four-fifths of the total production, the rest of the world will be using at least one-half of the rubber production. Among the bright features of the present situation are the very rapid increase in the consumption of rubber by countries outside America and the great advantage in the manufacture of rubber goods other than tires."

Mr. Macfadyen was chairman of the Rubber Growers' Association in 1927. From 1911 to 1916 and again in 1919-20 Mr. Macfadyen was chairman of the Planters' Association of Malaya and member of the Council of the Federated Malay States. He is now a member of Parliament for Wiltshire.

Reports from London state that Rubber Processes, Ltd., formed for the manufacture of rubber brake lining and Roberpile products, has recently gone into bankruptcy.

GOODYEAR OF CANADA IS INCREASING ITS SALES

Sales of the Goodyear Tire & Rubber Company of Canada and sales by its dealers both showed an increase over the previous year in the quarter ended December 31, according to a letter to stockholders from C. H. Carlisle, president. Export business declined during the period, largely due to the company's policy of reducing export stocks to a minimum.

Production during December increased by 1,000 tires a day over November, and the company has increased January output over December by 1,500 tires a day. Mr. Carlisle also said the company "is in excellent condition, both in crude and manufactured stocks."

Rubber Institution Meetings

The Manchester Section of the Institution of the Rubber Industry met in that city on January 23 and heard a paper by B. D. Porritt on "Some Aspects of Standardization." The London Section will meet on January 27 to hear a popular lecture by the Hon. F. A. Stockdale and on February 3 to hear a paper by the Northern Polytechnic and a note by B. B. Evans on "Sun Cracking of Vulcanized Rubber."

Golf Ball Imports Lower

Imports of golf balls into the United States during November numbered 43,072 valued at $13,901, a unit value of 32.3 cents per ball as compared with 32.1 cents in October and 32.8 cents in September. The November figures compare with imports in October of 56,484 balls, valued at $18,154, and with November, 1928, imports of 734 balls, valued at $297.

Latex Paper Firm Fails

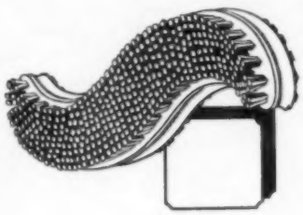
A resolution has been passed for the voluntary winding up of the affairs of Kaye's Rubber Latex Process, Ltd., the liquidator being F. Kaye. This firm has been manufacturing a rubber latex paper by a special process for a number of years, and its product was used extensively.

CATALPO
for
Treads

Rubber Goods and Specialties

"Ruba" Scrubbing Brush

As a substitute for ordinary scrubbing brushes which are difficult to clean and whose bristles are quickly worn out, Rubber Brushes, Ltd., 125 High Holborn, London, England, is selling the "Ruba" scrubbing brush. The use of rubber has been found to obviate the difficulties mentioned and at the same time to give the necessary



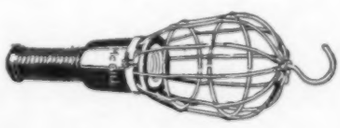
smoothness for fine laundry work. According to the manufacturers, it has been endorsed by laundry authorities for its cleanliness and durability.

Air Cell Inner Tube

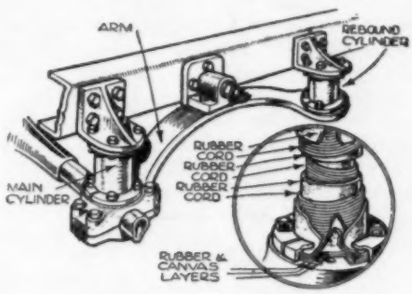
A pneumatic cell inner tube has recently been patented by E. Hibbert, an inventor of New South Wales, Australia. To eliminate punctures and blow-outs, the tube is molded from laminated soft rubber, layers of junction rubber, and tough tread rubber having air cells in staggered relationship. Friction between the tube and cover is prevented by grooves. Mr. Hibbert has assigned his patent to the Hibbert Pneumatic Cell Tire Co., Ltd., New South Wales.

Rubber Handle Lamp Guard

The McGill Manufacturing Company, Valparaiso, Ind., is marketing a new rubber handle, portable lamp guard. The black handle, made of high grade rubber, is easy to grip and will not slip out of the hand, but adapts itself to the movements of the wrist. The rubber handle is cut out to provide a solid rubber ledge which supports a fibre disk. The wires are then run



up through holes in the disk and a knot tied, eliminating all strain upon the socket connection. The rubber handle is flared and rounded at the end, eliminating all sharp bends in the cord, protecting it against wear, kinking and breakage. The cage is large enough for a 100-watt new type C lamp, and the guard may be had with a ten, twenty or thirty foot rubber cord and non-breakable rubber plug.



Automobile Rebound Cylinder

A pneumatic rebound cylinder which could be employed in place of road springs on motor cars has been recently devised by the Dunlop Rubber Company, Ltd., and Messrs. Paull, Fellowes and Nicholas. The basis of the device is a special form of closed cylindrical chamber, which may contain either air or a fluid, and this is so constructed that when subjected to an end load it will lengthen or shorten according to the force applied, without any substantial change in its diameter or cross-sectional area.

Such a cylinder can, therefore, be used in many applications in place of a piston and cylinder, having the advantage that the fluid is totally enclosed, with no joints or sliding surfaces to provide an opportunity for leakage. The cylinder itself is built up from layers of cord and rubber, with ends constructed of rubber and cross-woven canvas so arranged as to prevent distension. The cord structure of the cylindrical walls is of helical form, so that an end load alters the pitch of the helices but leaves the diameter substantially unchanged.

Many applications of this device are suggested in the patent specification, one of particular interest being an arrangement for supplanting road springs such as is shown in the illustration. Here the end of an axle is carried by a pivoted beam, suitable rubber cylinders being secured by split rings to each end of the beam and to brackets bolted to the chassis frame. One of the cylinders takes the normal loading and shocks, being filled either with air or a fluid, while the other is provided to act as a rebound damper.

Tool Kit Bags

Tool kit bags for the saddles of bicycles or motorcycles, recently patented by the Dunlop Rubber Company and F. R. Carr, are composed of rubber or rubber combined with another reinforcing material molded in one piece. The straps for affixing the bag in position on the saddle may be of the same material as the bag, but preferably are always reinforced by a canvas or like insertion. The edges and corners are preferably rounded, and the surface of the bag may be varnished or otherwise treated to enhance the appearance thereof.

Automobile Window Channel

Constructed with a thin spring steel heart encased in rubber, with an outer covering of color-fast felt, Standard window channel can be installed in a car without removing upholstery and is said to be scientifically designed to eliminate window troubles. The spring steel core is the supporting member of the channel and serves to retain the shape

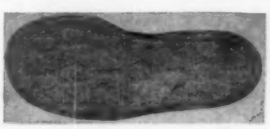
of the channel, to retain its longitudinal permanency, to resist elongation, to eliminate buckling and choking of the channel, and to assure perfect alignment and ease of window movement. It also presses the rubber and fabric bead snugly against the window without undue friction. The manufacturer is the Standard Products Company, 1011 Power Avenue, Cleveland, Ohio.

Ink from Scrap Rubber

Vulcanized rubber, such as old tires, is used as the basis of printing inks recently patented by L. C. Neale, Victoria, Australia. The rubber is first cut into pieces and immersed in a bath of sulfuric acid to dissolve the fabric, the mass then being neutralized with caustic soda, and subsequently dissolved in crude oil. Alternatively, the tires may be reduced to small pieces and treated immediately with the oil, being subsequently filtered to remove pieces of fabric, dirt, and other foreign matter. Carbon black or its equivalent, and a rosin-wood oil varnish are then added, and the whole mass ground to produce a liquid of the required consistency.

Du-Flex Bunny Sole

A late design of the Avon Sole Company, Avon, Mass., is the Du-Flex Bunny sole for children's shoes. Made of the same waterproof Gristle material as the rest of the Avon line, these soles are said to be tough



enough for heavy abuse but light and flexible enough for the sensitive feet of youngsters. This sole, according to the manufacturers, protects the foot and at the same time permits every muscle of the growing foot to come into play without interference. An attractive pattern of rabbits and dogs makes the sole appealing to children, and it is warranted not to mark or scar the floors.

Current Crude Rubber Items

STOCKS OF LATEX CREPE ARE HEAVY AT YEAR END

The greater part of crude rubber stocks in the Far East at the close of 1929 was in the form of latex crepe, according to figures cabled to the Rubber Exchange of New York from Singapore. Of the total stocks of 35,607 tons in hands of dealers on December 31, 17,184 tons comprised first latex crepe, while the amount of ribbed smoked sheet, the standard grade of the industry, totaled 14,327 tons. Stocks of unsmoked sheet totaled 2,263 tons, and scrap and lump rubber, 1,833 tons.

It was reported in Amsterdam on January 12 that a committee of the Dutch rubber growers is proceeding to the Far East to discuss measures with growers regarding regulation of estate outputs. It is regarded as possible that the committee will also confer with other foreign rubber growers on regulation of output, according to advices from Amsterdam.

Anglo-Dutch Raises Dividend

Despite the current low rubber prices, the Anglo-Dutch Plantations of Java have announced an increased interim dividend on the £2,350,350 of issued capital from 2½ to 3 per cent. Although this company is a large rubber producer, marketing some 9,000,000 pound annually, it also cultivates tea, coffee and other tropical products.

New Linggi Rubber Issue

The Linggi Rubber Plantations Company is offering £270,000 7 per cent first mortgage convertible and redeemable debentures at par. This represents part of a £400,000 issue already authorized.

Exchange Member Suspended

The board of governors of the Rubber Exchange of New York on January 17 announced the suspension of Ralph Fordon, member of the exchange for inability to meet obligations. Mr. Fordon is a member of the brokerage firm of Backus & Fordon, of Detroit, Mich., which recently instituted voluntary receivership proceedings.

COMMITTEES ARE NAMED FOR RUBBER EXCHANGE

The following floor committee, effective January 2, has been appointed by the Rubber Exchange of New York: J. Frank Dunbar, chairman; James R. Shannon, Lawrence G. Odell, Lewis D. Raabin and Arthur L. Dunn.

The following were appointed to serve as a quotation committee: Frank D. Pressinger, chairman; Alfred Croft and Elliot H. Simpson.

The new committee on spot quotations was named as follows: Daniel M. Fraser, Jr., chairman; James R. Shannon and G. A. Sullivan.

RUBBER FUTURES SALES MADE RECORD IN 1929

Sales of crude rubber for the year 1929 reached a new record high total on the Rubber Exchange of New York, amounting to 196,486 contracts, equivalent to 491,215 long tons of rubber.

This compares with 167,369 contracts for 1928, equivalent to 418,422½ tons, the previous record, and with 104,288 tons during the year 1927, equivalent to 260,720 long tons.

The high price was established during February this year at 26.70 cents for the near delivery, while the low was reached during December at 15.10 cents.

MORE USES FOR RUBBER URGED TO IMPROVE PRICE

Presiding at the tenth annual meeting of Waterfall (Selangor) Rubber Estates, Ltd., in London recently, W. R. Davies, J.P., declared restriction to be a hopeless proposition with 48 per cent of the area under rubber native-owned and the Dutch refusing to authorize restriction in the Netherlands East Indies.

"This," said Mr. Davies, "is a serious position, as restriction would be the simplest method of raising the price to a reasonable figure. The other method is an intensive campaign for largely increasing the demand.

"In many parts of the world there are huge tracts, with large populations, where roads are the merest tracks or where not even tracks exist. Automobile science has now provided vehicles which can use these tracks, or trackless areas, and where a demand for such methods of conveyance, whether for people themselves or for goods exists. Such a demand exists in India—where very large areas of population are located off the main roads and are served by tracks impossible for ordinary methods of traction—in Nigeria, West Africa, and Kenya.

"The difficulty, however, is that nobody will take the lead in providing means, at first, of course, only to a limited extent, of proving that such means of transport can be made paying propositions. I suggest that the Rubber Growers' Association, the Dutch rubber interests, and the automobile manufacturers should get together and spend a few thousand pounds in placing suitable vehicles in such districts as I have mentioned. This would promote developments which I believe would do more than anything else to resuscitate our depressed industry."

FAR EAST RUBBER CENSUS REPORTED TO EXCHANGE

The Far East rubber census for December, covering estates of 100 acres and over, showed production of 23,971 tons for the month, according to cables to the Rubber Exchange of New York. Dealers' stocks in the Far East, December 31, with the exception of holdings at Singapore and Penang, amounted to 16,776 tons.

December exports from the Federated Malay States, Straits Settlements, Johore, Kedah, Kalantan, Trangganun and Perlis amounted to 38,865 tons, of which 22,419 tons were shipped from the Federated Malay States.

Closing Prices on Rubber Exchange of New York, Inc.

FROM JANUARY 7 TO JANUARY 21, 1930

		Spot	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Sales*
Jan.	7	15.30	15.00	15.20	15.40	15.60	15.80	16.00	16.20	16.40	16.60	16.80	17.00	17.20	723
	8	15.00	14.80	15.00	15.20	15.40	15.60	15.80	16.00	16.20	16.40	16.60	16.80	17.00	308
	9	14.80	14.60	14.80	15.00	15.20	15.50	15.60	15.80	16.00	16.20	16.40	16.60	16.80	361
	10	14.40	14.20	14.40	14.60	14.80	15.00	15.20	15.40	15.60	15.80	15.90	16.10	16.30	432
	11	14.50	14.30	14.50	14.70	14.90	15.10	15.20	15.40	15.60	15.90	16.00	16.20	16.40	236
	13	14.90	14.70	14.80	15.00	15.20	15.40	15.60	15.80	16.00	16.30	16.40	16.60	16.80	746
	14	14.60	14.50	14.70	14.90	15.10	15.30	15.50	15.60	15.80	16.00	16.20	16.40	16.60	841
	15	14.60	14.50	14.60	14.80	15.00	15.20	15.40	15.60	15.80	16.00	16.20	16.40	16.60	168
	16	14.90	14.70	14.90	15.10	15.30	15.50	15.70	16.00	16.10	16.30	16.40	16.60	16.80	404
	17	15.40	15.20	15.40	15.60	15.80	16.10	16.30	16.60	16.80	17.00	17.20	17.40	17.60	950
	18	15.30	15.10	15.40	15.60	15.80	16.10	16.30	16.50	16.60	16.80	17.00	17.20	17.40	280
	20	14.70	14.60	14.80	15.10	15.20	15.40	15.60	15.90	16.10	16.30	16.50	16.60	16.80	665
	21	14.90	14.70	14.90	15.20	15.40	15.60	15.80	16.00	16.20	16.40	16.60	16.80	17.00	257

*In lots of 2½ tons each

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U. S. EXAMINATION FOR RUBBER TECHNOLOGIST

The United States Civil Service Commission has announced an open competitive examination for the position of junior rubber technologist, applications for which must be on file with the commission at Washington, D. C., not later than April 8. The examination is to fill vacancies in the Bureau of Standards, Department of Commerce; in the Geological Survey, Department of the Interior; and in positions requiring similar qualifications for duty in Washington or in the field.

Competitors will be rated on general chemistry, elementary physics and mathematics up to and including calculus, and practical questions on rubber technology. The entrance salary is $2,000 a year, and higher-salaried positions are filled through promotion.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the United States Civil Service Board of Examiners at the post office or custom house in any city.

PATENTS ARE ASSIGNED TO AKRON RUBBER MEN

Several patents on devices important to the rubber industry were granted by the government during the early part of January. The Patent Bureau recognized a six-year-old application filed by E. F. Maas of Akron on the invention of a machine for inserting airbags in tire casings by granting patents on 32 separate claims. Shares in the invention are assigned to the Goodyear Tire & Rubber Company.

The bureau also approved a 1927 application filed by Elmer G. Croakman on a method for dyeing rubber, recognizing 15 claims. The National Aniline & Chemical Company, New York City, is named as assignee.

The Goodyear Tire & Rubber Company is cited by the bureau as assignee for four other inventions, including a fabric cutting machine by Harold M. Brown, patentable on seven claims; a collapsible chuck, 14 claims recognized, by Edwin Templeton; a machine for cutting sheet material, 14 claims, by Laurence Metmore; and a windshield for vehicle wheels, by Charles H. Roth.

Horace D. Stevens was awarded a patent on a grooving tool of unique design, rights for which he has assigned to the Firestone Tire & Rubber Company. A process for marking tires was assigned to the India Tire & Rubber Company by William G. Lerch, who is now production superintendent of the Falls Rubber Company.

JOSEPH F. O'SHAUGHNESSY, general manager, and L. M. SIMPSON, general sales manager, of the tire department of the United States Rubber Company, are making a trip through the United States, visiting distributors in all sections of the country. At a meeting in Detroit on January 18, Mr. O'Shaughnessy addressed 200 dealers from that vicinity.

Goodyear Gives Park Land

A Christmas gift of 34.5 acres of land was given by the Goodyear Tire & Rubber Company for park purposes, according to an announcement made Christmas Day by the Metropolitan Park Board of Akron, O. This gift will eventually be joined with other park tracts and will take care of recreational needs of East Akron residents.

White Workers Rewarded

More than $1,000 in cash gifts was distributed among the employes of the White Rubber Company, Ravenna, O., manufacturer of drug sundries, last month. On the occasion of the presentation of these service awards, E. J. Smith, president of the company, reviewed the business of the year. Organized in 1918, the White Rubber Company has never experienced a shutdown in its departments. It has an average payroll of 35 workers.

Schwarzwaelder Name Change

The Schwarzwaelder Company, 1017 Wood street, Philadelphia, Pa., which until now has run both its cloth finishing plant and its rubberizing division under the same name, has decided to operate the two units under dissimilar names. The cloth finishing business will continue as heretofore, as the Schwarzwaelder Company, while the rubberizing division will operate as the Aldan Rubber Company. The change is in name only, as the management, policy and financial structure will remain identical.

Eagle-Picher Labor Record

The industrial relations policy of the Eagle-Picher Lead Company, operating in the tri-state district of Missouri, Kansas and Oklahoma, has had the effect of preventing a strike throughout its operations during the last 55 years. It also has the distinction of not having ever been asked by its workers for an increase in wages or a change in working conditions, according to O. N. Wampler, safety director of the company, in a recent article in the *Mining Congress Journal*. The company has established wage scales under which wages are raised or lowered 25 cents a day with each $5 raise or reduction in the price per ton of zinc ore.

Offers Plant Site Aid

Manufacturing concerns in any part of the country, which face production and distribution difficulties incident to plant location, will have at their disposal in the solution of these problems the technical engineering staff of the newly organized Industrial Development Bureau of the Niagara Hudson Power Corporation of New York, it has just been announced. The bureau has been formed to promote the industrial development of New York State, but will seek to interest only those firms which it is believed can do business better and more economically by locating a plant in New York. The main office of the bureau is in Albany, N. Y., with branches in Buffalo and Watertown, N. Y.

DILL SALES CONFERENCE IS HELD IN CLEVELAND

With sales for 1929 substantially ahead of any previous record of the company, The Dill Manufacturing Company, Cleveland, is looking forward to 1930 with optimism, according to L. F. Body, manager of sales.

The factory in Cleveland was the scene of a 3-day conference December 26 to December 30, inclusive. The entire field organization of the company was in attendance, and new products, to be announced early in the year, were received with enthusiasm.

In addressing the conference at its opening session, Mr. Body stated that dealers, especially those attempting "super service," were giving more and more attention to the subject of tire valves, valve parts and valve accessories, and the part such products play in providing real tire service.

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SITUATIONS WANTED

SUPERINTENDENT or General Foreman, technical graduate with twelve years' experience in the manufacturing of tires, tubes, heels and soles. Thoroughly competent to take charge of factory or department. Full knowledge of cost, compounds, construction and all factory details. References furnished. Address Box 545, THE RUBBER AGE.

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Cushion Stocks

LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, JANUARY 20, 1930

RUBBER

Crude

THE year 1930 has opened inauspiciously for crude rubber producers with a price range to date between 14½ and 15⅞ cents a pound. The price of 14½ cents, reached at the close on January 10 on the New York market, marked a new low for the period from October, 1922, to the present.

A brief rally was staged as the result of conversations between British and Dutch producers with the aim of working out a co-operative restriction plan. Even this demonstration did not bring the price back to the quotations at which the month had opened; and as soon as doubt was expressed as to the success of the negotiations, the commodity dropped back sharply.

Despite the apparent inactivity that has been prevailing, the sales turnover in the December delivery of crude rubber on the Rubber Exchange reached a record high total for any one month at 44,793 contracts, equal to 111,982½ long tons. This, of course, covers a year's trading and does not reflect the present situation, which has led one London broker to declare that "there would, indeed, seem to be every reason for expecting at the moment a protracted period of dismal stagnation."

Prices quoted on the New York outside market on January 20 were as follows:

Plantations—

Ribbed Smoked Sheets—			
Spot-Jan.	.14¾	@	.15
Feb.-Mar.	.14⅞	@	.15¼
Apr.-June	.15⅛	@	.15¾
First Latex, crepe spot	.15⅛	@	.15¾
Amber Crepe, No. 2	.13⅝	@	.13⅞
Amber Crepe, No. 3	.13¼	@	.13⅜
Amber Crepe, No. 4	.12¾	@	.13
Brown Crepe, Clean thin	.13	@	.13¼
Brown Crepe, specky	.12⅝	@	.13
Liquid Latex, per gal.	.90	@	

Paras—

Up-river Fine	.16¼	@	.16½
Up-river Medium	Nominal		
Up-river Coarse	.08¼	@	.08½
Acre Bolivian, fine	.16½	@	.16¾
Caucho Ball, Upper	.08	@	.08¼
Islands, fine	Nominal		

Centrals—

Central, scrap	.08¼	@	—
Esmeraldas	.08¼	@	—

Balata—

Block, Colombia	Nominal		
Block, Ciudad	.41	@	.42

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Jan.	7¼	@	7⅝d
Feb.-Mar.	7⅜	@	7½d
Apr.-June		@	7⅝d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	—	@	7⅝d

Scrap

The start of the year has seen something of an increase in demand for rubber scrap, and this is expected to continue to gain as reclaimers raise their rates of production. Prices at the close of the fortnight were slightly lower, closing as follows:

(Prices to Consumer)

Auto tire peelings	ton 35.00	@	37.50
Standard White auto	ton 45.00	@	47.50
Mixed auto	ton 21.00	@	22.50
Bicycle tires	ton 18.50	@	20.00
Clean solid truck tires	ton 25.00	@	26.00
Boots and shoes	cwt. 1.40	@	1.45
Arctics, untrimmed	lb. .00⅞	@	.01
Inner tubes, No. 1	lb. .07¼	@	.07½
Inner tubes, No. 2, compounded	lb. .03⅞	@	.04
Inner Tubes, Red	lb. .04	@	.04¼
Air Brake Hose	ton 22.50	@	25.00
Rubber Hose	ton 17.50	@	20.00

Reclaimed

Based on the monthly statistics of the Rubber Manufacturers Association, considered as representing 70.2 per cent of the domestic industry, the consumption of reclaimed rubber in the United States last year totaled 226,588 long tons. The Department of Commerce, however, has revised its estimate of the accuracy of the association's figures downward, and now considers them as only 69.4 per cent complete. Prices for the various grades closed the fortnight as follows:

High Tensile

Super-Reclaim No. 1 Black	lb.	.12	@	.12¼
High Tensile Red	lb.	.11	@	.11½

Shoe

Unwashed	lb.	.07	@	.07¼
Washed	lb.	.09½	@	.10

Tube

No. 1 (Floating)	lb.	.12	@	.12½
No. 2 (compounded)	lb.	.09½	@	.10

Tires

Black	lb.	.07	@	.07¼
Black, selected tires	lb.	.07¼	@	.07⅜
Dark Gray	lb.	.08¾	@	.09
Light Gray	lb.	.09¾	@	.10¼
White	lb.	.11½	@	.12
Truck, Heavy Gravity	lb.	.07	@	.07¼
Truck, Light Gravity	lb.	.07¼	@	.07½

Miscellaneous

Mechanical blends	lb.	.06½	@	.07
Red	lb.	.11¼	@	.12

COTTON and FABRICS

Cotton

PRICE quotations for cotton closed the fortnight slightly higher than they had been at the end of the previous two weeks. Activities of the Federal Farm Board were mainly responsible for the rise, rather than any strength in the position of the commodity itself. The New York spot quotation has shown a tendency to hold fairly steadily in the neighborhood of 17.45 cents a pound, which is appreciably above the low figures reached during December.

The high, low and closing prices for the commodity quoted on the New York Cotton Exchange on January 20 were as follows:

	High	Low	Close	Close
		Jan. 20		Jan. 4
Jan.	17.17	17.07	17.17	16.97
Mar.	17.23	17.24	17.32	17.11
May	17.53	17.43	17.52	17.35

Tire Fabrics

Moderate sales of tire fabrics have been reported during the past two weeks, with prices gaining slightly in sympathy with the advance in raw cotton. The domestic tire industry is estimated by the Rubber Manufacturers Association to have consumed a total of 13,691,693 pounds of cotton fabric during the month of November. Latest price quotations are as follows:

CORD

Peeler carded, 23/5/3	lb.	.44¾	@	.45
Peeler, carded, 23/4/3	lb.	.46¾	@	.47
Peeler, carded, 13/3/3	lb.	.42¼	@	.42½
Peeler, carded, 15/3/3	lb.	.42¾	@	.43
Egyptian, carded, 23/5/3	lb.	.49	@	.49¼
Egyptian, combed, 23/5/3	lb.	.55	@	.50¾

CHAFERS

Carded, American, 8 oz.	lb.	.37½	@	.38½
Carded, American, 10 oz.	lb.	.38½	@	.39
Carded, American, 12 oz.	lb.	.38	@	.39
Carded, American, 14 oz.	lb.	.37	@	.43

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.39	@	.43
Carded, American, 10¼ oz.	lb.	.39	@	.43

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.44½	@	.45½
Carded, American, 17¼ oz. 10-ply	lb.	.37½	@	.38½

Sheetings

Sheetings have declined in price during the past fornight, but the losses have been only fractional. Business has closed the period fairly active, with prices as follows:

40-inch, 2.50-yard	yd.	—	@	.11½
40-inch, 2.85-yard	yd.	.09⅞	@	.10
40-inch, 3.15-yard	yd.	—	@	.10⅝
40-inch, 3.60-yard	yd.	—	@	.09
40-inch, 3.75-yard	yd.	—	@	.08
40-inch, 4.25-yard	yd.	—	@	.07

Ducks

Except for a decline in hose and belting ducks, these goods ended the fortnight with price quotations unchanged.

Belting and Hose	lb.	.34½	@	.35
Enameling	lb.	.34	@	.36
Single filling	lb.	.14½	@	.15½
Double filling	lb.	—	@	.17

CHEMICALS

CARBON black met with another reduction in price during the fortnight, with quotations on carlots at the works in Texas being forced down as is indicated in the price list tables below, to the extent of a 25-point drop. This reduction was believed the result of competition and overproduction in the face of a rather light demand. Rubber manufacturers continued taking in restricted quantities, but are expected to commence purchasing for spring production shortly. Reductions in price have been noted in destructively distilled pine oil, but in other respects the list of chemicals and compounding ingredients has remained practically unchanged. Manufacturers are preparing for a gradually increasing demand for their products during coming months.

ACCELERATORS

Organic				
A-1	lb.	.24	@	.27
A-5-10	lb.	.33	@	.36
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
A-32	lb.	.80	@	.95
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16
Captax	lb.	.60	@	.70
Crylene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.44½
Diphenylguanidine	lb.	.30	@	.32½
Dipsol	lb.	4.30	@	4.50
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.40	@	.42½
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.58½	@	.61
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.37½	@	.40
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.80
Phenex	lb.	.75	@	—
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
R-2	lb.	1.95	@	2.15
Safex	lb.	1.20	@	1.25
SPDX	lb.	.75	@	—
Super-Sulphur No. 1	lb.	.50	@	.52
No. 2	lb.	.18	@	.25
Tensilac, No. 39	lb.	.40	@	.42½
Tensilac, No. 41	lb.	.50	@	.52½
Thermic F	lb.	.50	@	.55
Thiocarbanilid, drums	lb.	.25½	@	.28½
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.62½
Tuads	lb.	3.25	@	3.50
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Z 88	lb.	.50	@	.60
Zimate	lb.	4.00	@	5.00
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	—
Lead, white	lb.	.08½	@	.08¾
Litharge, domestic	lb.	.09¼	@	.11
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)

Blues				
Prussian	lb.	.35	@	.36
Ultramarine	lb.	.06	@	.32
Browns				
Sienna, Italian	lb.	.05½	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.30	@	.32
medium	lb.	.31	@	.33
dark	lb.	.34	@	.36
Chromium Oxide, bbl.	lb.	.34½	@	.35½
Reds				
Antimony crimson, 15/17	lb.	.40	@	.44
sulfur, free	lb.	.56	@	.66
golden 15/17 F.S.	lb.	.20	@	.25
Indian English	lb.	.08	@	.11
Domestic (Maroon)	lb.	.11	@	—
Oxmony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Venetian red	lb.	.03	@	.06
Vermillion, quicksilver, English	lb.	2.00	@	2.05
Whites				
Lithopone, Akrolith	lb.	.05 3/5	@	.06
Lithopone, Albalith	lb.	.05¼	@	.05¾
Lithopone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox B, f.o.b. St. Louis,	lb.	.07¼	@	.07¾
Titanox C, f.o.b. St. Louis,	lb.	.07¾	@	.08¼
Zinc Oxide—American Process				
American Azo: ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.06⅞
Horsehead Brand: Special	lb.	.07	@	.07½
XX Green	lb.	.07	@	.07½
XX Red, lead free	lb.	.06½	@	.07
Kadox, black label	lb.	.10⅝	@	.10⅞
blue label	lb.	.09⅝	@	.09⅞
red label	lb.	.08	@	.08½
Zinc Oxide—French Process				
White seal	lb.	.11⅝	@	.11⅞
Green seal	lb.	.10⅝	@	.10⅞
Red seal	lb.	.09⅝	@	.09⅞
Yellows				
Chrome	lb.	.17	@	.17½
Ocher, French medium	lb.	.02	@	.03
domestic	lb.	.01¾	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate, lump	lb.	.07½	@	.07¾
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Blacks				
Arrow "Aerfloted"	lb.	.06½	@	.12
Bone Black	lb.	.07	@	.08½
Carbon, compressed	lb.	.06	@	.11
Carbon, uncompressed	lb.	.05¾	@	.10
Disperso, f.o.b. Louisiana	lb	.056	@	—
Disperso, f.o.b. Texas	lb.	.05½	@	—
Drop Black	lb.	.06	@	.14
Fumonex	lb.	.04½	@	.08
Excello, compressed	lb.	.06½	@	.12
Gastex, f.o.b. Texas	lb.	.04¼	@	.05½
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.06½	@	.12
Thermatomic-Thermax	lb.	.04	@	.07
Flex	lb.	.05	@	.08
P-33	lb.	.06	@	.09
United carbon, fob Tex.	lb.	.06	@	—
Velvetex carbon	lb.	.04	@	.06
Blanc fixe dry f.o.b. works	ton	75.00	@	90.00
Carrara filler	lb.	01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	10.00	@	22.00
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Dark Blue Ridge	ton	9.00	@	20.00
Dixie	ton	15.00	@	29.00
Langford	ton	10.00	@	—
Lexington	ton	10.00	@	22.00
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Par	ton	7.00	@	—
Tensulite		15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	08¾	@	.11
Mica, white water grnd.	lb.	.06	@	.08
Off color (biotite)	lb.	.05	@	.07
Rotten Stone powdered)	lb.	.02	@	.05
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.82	@	4.02
Talc, domestic	ton	12.00	@	15.00
Pyrax A	ton	7.50	@	—
Whiting, commercial	cwt.	1.00	@	1.25
English cliffstone	cwt.	1.75	@	2.00
Quaker	ton	13.00	@	22.00
Superfine	ton	10.00	@	12.00
Sussex	ton	8.00	@	15.00
Witco	ton	20.00	@	—
Zinc Carbonate	lb	.09¼	@	.10½
Zinc Stearate	lb.	.23½	@	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Granulated M. R.	ton	30.00	@	45.00
Hard Hydrocarbon	ton	24.00	@	40.00
Paradura	ton	62.50	@	65.00
Pioneer, MR, solid	ton	40.00	@	42.00
Pioneer-granulated	ton	50.00	@	52.00
R & H Hydro-Carbon	ton	27.95	@	29.00
Robertson, MR, solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 66°	cwt.	1.60	@	1.95
Tartaric, crystals	lb.	.38	@	.38½
Acids, Fatty				
Stearex	lb.	.15	@	.19
Stearic, double pressed	lb.	.17	@	.22
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	
Oils				
Corn, refined, bbls.	lb.	.07¾	@	.09½
Cottonseed, crude		—	@	.07⅞
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c. l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04½
Fluxrite	lb.	.05½	@	.06½
Palm Lagos	lb.	.07¾	@	—
Niger	lb.	.07½	@	—
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08½
Pigmentaroil	gal.	.21	@	.26
Pine, steam distilled	gal.	.65	@	.70
destructively distilled	gal.	.55	@	.58
Witco Palm Oil	lb.	.11	@	—
Witco Softener (f.o.b. works)	lb	.02	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb.	bbl.	—	@	8.55
Pigmentar	lb.	.038	@	.0446
Tar Retort, 50 gal.	bbl.	13.50	@	15.00
Solvents				
Acetone, pure	lb.	.11	@	.13
Alcohol denatured, No. 1 bbls.	gal.	.51	@	—
Benzol, 90%	gal.	.23	@	.25
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride	lb	.06¼	@	.07
Dryolene (f.o.b. Okla.)	gal.	.10	@	.10½
Motor gasoline, steel bbls.	gal.	.16	@	—
Naptha, solvent	gal.	.35	@	.40
Rub-Sol (f.o.b .Okla.)	gal.	.09	@	—
Turpentine, spirits	gal.	.53	@	.59
wood	gal.	—	@	.50
destructively distilled	gal.	.40	@	.43
Waxes				
Beeswax, white	lb.	.51	@	.53
Carnauba	lb.	.35	@	.36
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.06½	@	.07
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Paraffin (c. l.—f.o.b. N. Y.)				
Yellow crude scale	lb.	.03¾	@	
White crude scale 124/126	lb	.04	@	
Refined, 125/127	lb.	.05⅛	@	
Refined, 128/130	lb.	.05½	@	
Refined, 135/137	lb.	.07¾	@	
Refined, 138/140	lb.	.08¼	@	

ANTI-OXIDANTS

Agerite, Resin	lb.	.57	@	.62
Powder	lb.	.57	@	.62
White	lb.	1.10	@	1.20
Albasan	lb.	.70	@	.75
Antox	lb.			
Neozone	lb.			
Oxynone	lb	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.57	@	.62
Stabilite Alba	lb.	.70	@	.75
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼	@	.03½
Sulfur flour, Refined, 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags)	cwt.	1.75	@	2.10
Vandex	lb.	1.80	@	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

GROSS imports of crude rubber into the United States during 1929 totaled 561,242 long tons. Should the amount of re-exports in December prove to be 2,500 long tons, the actual net imports for the year will have been almost exactly 525,000 long tons. This is the heaviest figure for crude rubber importation in the history of the American industry, comparing with net imports of 407,572 long tons in 1928 and with 398,483 long tons in 1927.

With consumption during the year at approximately 470,000 long tons, there would appear to have been a surplus at the end of the year of 55,000 long tons. Combining this figure with the stocks at the end of 1928 of 66,166 long tons, it would seem that the domestic carryover from 1929 to 1930 should have been in the neighborhood of 121,000 long tons. The Rubber Manufacturers Association, however, reports stocks on hand as of December 31 at 105,137 long tons, apparently leaving 16,000 long tons to be accounted for by spoilage and other losses.

While total crude rubber imports last year were the heaviest in history, the declared value was the lowest for the past five years at $239,753,121, an average of 19.15 cents a pound. With the exceptions of the two years of 1921 and 1922, this is probably the lowest average declared value per pound ever recorded for the commodity.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
192.	[illegible]	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	418,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,259	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,781	344,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	561,242	239,753,121	19.15				
1927:							
Jan.	43,340	36,758,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	25,698,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.85	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,910	26,396,931	35.92	1,809	1,382,768	34.12	31,097
Sept.	33,891	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,151	22,163,282	32.79	2,513	2,042,713	36.[illegible]	
Nov.	38,592	27,395,422	31.69	2,469	2,014,196	36.48	36,123
Dec.	40,787	22,218,574	32.26	2,655	2,245,754	37.77	28,092
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.96	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,719	2,587,435	31.07	36,893
Apr.	37,935	27,207,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,259	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,935	16,512,019	18.50	3,039	1,384,148	20.34	36,797
Oct.	44,658	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,819	14,878,441	18.19	2,799	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,584	22,872,943	17.74	3,683	1,773,491	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,694	20,330,905	17.98	4,218	2,094,037	22.16	46,886
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.78	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	19.27				

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,935	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	29,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,780
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	47,831
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	49,233
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	43,227
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	41,526
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	38,274
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	34,707
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	34,800
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	27,659
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	23,531
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	469,804

Figures on Quarterly Basis

Quarter	1922	1923	1924	1925	1926	1927	1928	1929
Jan./Mar.		96,776	87,609	95,263	94,301	99,216	103,553	128,565
Apr./June	127,360	89,493	75,674	104,099	87,109	103,242	103,500	139,292
July/Sept.		55,621	83,813	99,493	93,793	89,210	117,578	113,746
Oct./Dec.	155,067	63,617	92,656	85,789	83,212	80,860	117,597	
Totals	282,427	305,507	339,752	384,644	358,415	372,528	442,227	381,603

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Oct. 19	6,991	590	1,819	383	9,783
Oct. 26	6,194	1,406	1,558	242	9,400
Nov. 2	7,776	960	2,012	51	10,799
Nov. 9	7,103	648	1,470	106	9,327
Nov. 16	5,584	571	1,960	52	8,167
Nov. 23	6,109	919	1,711	78	8,817
Nov. 30	6,672	1,404	2,205	9	10,290
Dec. 7	8,543	1,920	2,115	16	12,594
Dec. 14	7,428	1,299	1,655	6	10,388
Dec. 21	7,599	1,958	2,003	22	11,577
Dec. 28	4,943	364	1,856	5	7,168
Jan. 4	8,067	1,587	2,419	251	12,124
Jan. 11	7,235	981	1,469	15	9,650

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1927																																
July	35½	—	—	—	35¼	34½	34½	34½	34½	—	34½	34½	34½	34½	34½	34½	35	35½	35	35	35½	35½	35	35	35	34½	35	35	35	—	—	34½
August	35½	—	35¼	35⅝	35½	35½	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35⅝	35½	35½	33½	34¼	34¼	33⅝	34	34	33¾	34	35¼	35¼
Sept.	34	—	33¾	33½	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	35	35	34	34	34	33¾	35¼	34¼
Oct.	35⅝	—	33¼	33⅛	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	33⅝	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	34¼	35	35	35	35	35	35¼	35¼	34¼
Nov.	35	—	35¼	35⅝	36⅛	36⅛	36⅛	36⅛	36⅛	36⅛	36⅛	36⅛	36⅛	36½	36½	37⅛	37⅛	37⅛	37⅛	37⅛	37⅛	37⅛	37⅛	37⅛	40½	40½	40½	40½	40½	40½	41⅛	37¼
Dec.	40½	—	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40½	40½	40½	40½	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40¼	40½	41½	41¼	41¼	41¼	41¼	40¾
1928																																
January	—	41¾	41¼	41¼	41¼	41	41	41	—	—	41¼	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40¾	40½	39¾	39¾	39¾	39	38¾	40¼
February	29	37½	37¾	37¾	—	36¾	36¾	—	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36¾	36½	36½	36½	36½	29	29	28¾	—	28¾	32¾
March	28	28½	28½	29	28¾	28¾	26¾	25½	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	27¼	28	28	27¾	27¾	26[illegible]
April	27¼	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	27½	19
May	17½	17¾	18¼	18¾	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19½
June	17¾	18¾	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
July	18¾	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
August	19½	19½	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
September	18¾	18½	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½
October	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
November	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾	18¾
December	17¾	—	17¾	17¾	17¾	17¾	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼
1929																																
January	—	22¾	18¼	18¼	18¼	18¼	22¾	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼	18¼
February	22¾	22	21¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾
March	26	26	26	26	26	26	26	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½	25½
April	23	23½	22¾	22¾	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½
May	19%	19%	19%	19%	20¾	20¾	20¾	20¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
June	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
July	20¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
Aug.	21¾	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Sept.																																
Oct.	19¾	19½	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼	20¼
Nov.	17¾	17¾	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼	19¼
Dec.	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾
1930																																
January	—	15¾	15¾	15¾	15¾	—	15¾	15¾	15¾	15¾	15¾	14⅞	14⅞	14⅞	14⅞	14⅞	15½	15½	—	14⅞												

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	15.82	32.75	25.86	36.71	79.50	38.75	40.25	26.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.56
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.12
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.99
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1	9¾	8⅞	—	—	17	9¾	—	8	7⅝
2	9½	8⅝	8	7⅞	18	9¾	8⅛	8	7⅝
3	9⅝	—	7⅞	7¾	19	9¾	8	7⅞	—
4	9½	8½	8	7¾	20	—	8¼	7⅞	7⅝
5	9¾	8⅛	8	—	21	9¾	8¼	7⅞	—
6	—	8⅝	8	7¾	22	9⅝	8¼	—	—
7	9¾	8¼	8	7⅝	23	9⅝	8⅛	7¾	—
8	10	8¼	—	7⅝	24	9⅜	—	7¾	—
9	10	8⅛	8	7⅝	25	9⅛	8⅛	—	—
10	9⅞	—	8	7⅛	26	9⅛	8¼	—	—
11	9⅞	8⅛	8⅛	7	27	—	8⅛	7⅞	—
12	10	7⅞	8	—	28	9⅛	8	7⅞	—
13	—	7⅞	8	7¼	29	9	8	—	—
14	10	8⅜	8	7¼	30	9⅛	8	8	—
15	10	8⅜	—	7¼	31	9⅛	—	8	—
16	9⅞	8⅛	8	7½					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	10.505
Feb.	19.021	15.713	11.875	Sept.	16.298	8.590	10.160
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	9.620
Apr.	19.897	8.864	10.490	Nov.	18.159	8.596	8.442
May	19.769	8.845	10.717	Dec.	19.690	8.570	7.958
June	17.880	9.293	10.580	Average			
July	16.770	9.812	11.065	for Year	18.375	10.656	10.291

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Dec.	Jan.	Day of Month	Dec.	Jan.	Day of Month	Dec.	Jan.
1	——	——	11	17.30	17.50	21	17.25	——
2	17.30	17.45	12	17.25	——	22	——	——
3	17.55	17.30	13	17.25	17.55	23	17.25	——
4	17.55	17.15	14	17.20	17.45	24	17.25	——
5	17.35	——	15	——	17.45	25	——	——
6	17.50	17.05	16	17.00	17.40	26	17.40	——
7	17.40	17.15	17	17.05	17.45	27	17.40	——
8	——	17.05	18	17.15	17.35	28	17.30	——
9	17.20	17.45	19	17.20	——	29	——	——
10	17.35	17.35	20	17.00	17.35	30	17.30	——
						31	17.25	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	18.62
Feb.	14.10	18.40	20.21	Sept.	21.96	18.67	18.23
Mar.	14.32	19.38	20.19	Oct.	20.22	19.62	18.46
Apr.	14.75	20.63	20.29	Nov.	20.22	19.84	17.53
May	16.07	21.58	19.41	Dec.	19.58	20.22	17.28
June	16.85	21.50	18.74	Average			
July	18.00	21.36	18.62	for Year	17.49	19.97	19.03

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,316	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083	107,659	38,963	33,986	55,409	131,720	147,069	163,068
May	94,566	105,356	97,192	44,181	34,374	55,404	138,744	139,730	152,596
June	89,250	90,198	92,061	47,233	40,001	46,035	136,483	130,119	138,096
July	98,469	83,242	92,535	40,687	42,304	38,858	139,056	125,546	134,393
Aug.	96,148	68,994	90,769	40,937	51,875	41,618	137,085	120,869	132,387
Sept.	97,829	68,851	84,362	37,966	48,566	49,480	135,795	117,417	133,842
Oct.	97,452	66,421	88,483	42,804	41,571	62,294	140,256	107,992	150,777
Nov.	101,034	61,956	92,219	37,076	62,119	62,358	138,110	130,075	154,577
Dec.	100,130	66,166	105,138	47,938	68,764	62,389	148,068	134,930	167,527

(Rubber Manufacturers' Association figures raised to 100%.)

Stock of Crude Rubber in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1927	1928	1929	At end of	1927	1928	1929
Jan.	54,994	66,524	25,191	July	63,717	35,429	30,080
Feb.	58,826	62,964	25,554	Aug.	64,491	32,084	35,605
Mar.	63,055	58,272	28,214	Sept.	68,236	31,440	42,188
Apr.	66,897	53,425	31,868	Oct.	69,569	24,207	
May	67,169	44,628	31,290	Nov.	67,050	17,775	
June	63,902	38,756	31,025	Dec.	63,793	19,815	

At End of Recent Weeks
Stocks in London

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1929					
March	25,441	25,920	26,442	27,656	28,077
April	28,934	30,446	30,503	31,213	
May	31,580	31,127	30,955	30,893	
June	31,539	31,635	31,127	30,617	30,982
July	29,996	30,661	30,790	30,167	
August	30,937	31,444	33,573	34,651	35,605
September	36,620	37,901	40,151	42,077	
October	43,478	44,339	45,711	46,819	
November	48,092	49,302	50,068	51,012	52,538
December	53,431	53,180	53,894	54,260	
1930					
January	56,616	58,990			

Stocks in Liverpool

1929					
March	4,255	4,136	4,100	4,333	4,433
April	4,442	4,591	4,521	4,779	
May	4,614	4,334	4,216	4,665	
June	4,642	4,750	4,733	4,515	4,628
July	4,398	4,547	4,757	4,739	
August	4,662	4,481	5,993	7,285	7,560
September	8,351	8,660	9,780	10,161	
October	10,795	11,571	11,788	12,665	
November	14,272	16,158	17,543	17,479	17,752
December	17,922	18,263	18,696	19,059	
1930					
January	19,438	19,640			

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,668	33,859
Feb.	26,766	22,867	32,873	Aug.	25,764	18,971	30,834
Mar.	27,844	20,538	29,437	Sept.	25,178	14,898	32,138
Apr.	24,543	16,946	26,474	Oct.	25,790	12,149	35,770
May	25,133	17,437	30,764	Nov.	28,369	29,188	30,968
June	21,898	18,207	30,403	Dec.	25,798	32,895	—

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1926	24,199,524	78.8
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1929					
January	1,835,207	79.4	July	1,896,666	78.2
February	2,265,024	80.8	August	1,570,099	79.4
March	2,613,389	80.4	September	2,110,003	80.7
April	2,729,899	81.3	October	1,647,350	76.4
May	2,574,224	76.5	November	596,989	64.7
June	2,184,219	75.8	December	879,259	79.0

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1928	1929	MONTHS	1928	1929
January	20,938,000	22,602,000	July	30,960,000	36,860,000
February	21,186,000	22,776,000	August	33,148,000	37,759,000
March	24,041,000	28,495,000	September	29,691,000	34,193,000
April	25,712,000	32,019,000	October	30,610,000	32,816,000
May	27,355,000	34,117,000	November	26,222,000	31,502,000
June	29,022,000	33,163,000	December	26,644,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,287	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819	7,519	5,701	5,781	6,708	11,568	12,389	16,351
Apr.	6,299	6,178	7,884	5,701	5,812	7,294	12,122	12,71.	16,929
May	6,151	6,759	8,145	5,657	6,457	7,184	12,462	13,024	17,849
June	6,202	6,692	7,304	6,253	7,117	7,254	12,462	12,162	17,957
July	5,087	6,498	6,475	5,973	7,895	7,855	11,326	11,157	15,880
Aug.	5,752	7,469	5,806	6,393	8,403	7,845	10,721	10,034	14,226
Sept.	4,822	6,802	4,758	5,717	7,145	5,998	9,722	9,765	12,875
Oct.	4,773	7,326	4,919	4,799	5,717	4,960	9,665	11,520	12,845
Nov.	4,502	6,075	3,603	4,306	4,998	3,558	10,136	12,579	12,935
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231	7,466	6,157	5,731	6,737	17,096	15,573	17,750
Apr.	7,373	6,661	7,634	6,359	5,702	7,164	17,801	16,638	18,184
May	6,737	7,168	7,660	6,140	6,300	7,088	18,389	17,702	18,928
June	6,306	6,953	6,978	6,832	7,136	6,950	17,858	17,159	18,741
July	5,284	6,674	6,178	7,070	8,729	8,113	16,004	14,974	16,832
Aug.	6,480	8,343	5,846	7,983	9,350	8,183	14,664	13,931	14,157
Sept.	5,651	7,103	5,536	6,758	7,154	6,250	13,511	13,543	13,424
Oct.	5,065	6,929	5,310	5,024	5,662	5,001	13,539	15,285	13,656
Nov.	4,775	5,592	3,780	4,728	5,002	3,712	13,585	15,743	13,701
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	232,502
Feb.	323,358	290,330	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,137	2,287	226,994
Dec.	119,950	92,717	27,233				
TOTAL	5,358,361	4,603,609	754,752				

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]				DUTCH EAST INDIES[5]								
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[4]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[5]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,956
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,529
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1927:															
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,768	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	**27,789**	**16,618**	**11,171**	**3,830**	**1,605**	**842**	**581**	**525**	**4,851**	**7,988**	**11,774**	**1,109**	**2,273**	**1,026**	**47,565**
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,49[illegible]
Apr.	**20,139**	**9,385**	**10,804**	**3,233**	**789**	**630**	**494**	**258**	**3,993**	**5,040**	**5,499**	**736**	**1,014**	**1,323**	**33,810**
May	**26,483**	**10,350**	**16,133**	**3,091**	**654**	**842**	**494**	**241**	**4,943**	**5,355**	**10,347**	**717**	**2,602**	**1,135**	**45,994**
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	**35,674**	**15,114**	**20,560**	**5,720**	**398**	**1,227**	**593**	**544**	**5,668**	**7,438**	**11,893**	**712**	**1,732**	**450**	**56,936**
Sept.	**29,769**	**11,239**	**18,530**	**4,675**	**457**	**938**	**594**	**447**	**4,956**	**6,536**	**9,863**	**969**	**1,614**	**494**	**50,073**
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	528	73,982
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	650	1,922	733	66,824
June	40,398	14,344	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	608	1,398	548	60,868
July	46,454	15,071	31,383	5,457	974	1,247	500*	462	6,422	7,192	13,995	555	1,457	543	70,187*
Aug.	50,441	15,469	34,972	6,079	685	993	500*	431	4,644	7,298	10,782	545	1,563	499	68,991*
Sept.	53,484	12,392	41,092	7,993	384	832	500*	406	4,708	7,517	10,149	755	1,566	504	76,406*
Oct.	47,937	12,516	35,421	8,411	812	1,047	500*	485	4,697	8,295	10,512	893	1,606	445	73,124*
Nov.	46,279	11,204	35,075	7,195	1,065	668	500*	278	4,760	6,711	9,380	771	1,442		
Dec.	48,513	13,451	35,062	8,683									1,674		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ea)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,718	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,984	6,430	2,493	2,643	172	3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,688	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,642
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1927:															
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,861	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	548	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,958
Dec.	40,781	8,488	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	**61,331**	**5,179**	**5,001**	**4,618**	**2,908**	**2,727**	1,259	684	1,131	627	113	226	115	356	86,275
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,233
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	420	65,787
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	68,301
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	700*	724	902	254	429	25	319	69,331*
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	700*	853	672	253	361	50*	477	67,770*
Oct.	35,840	16,111	4,489	3,355	1,821		1,838		1,125		278	710		201	
Nov.	40,972				2,709										

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 748 tons in the first 8 months of 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	188,312,000	12,258,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1928:				
January	2,177,000	17,682,000	3,481,000	$5,630,000
February	2,575,000	19,181,000	3,628,000	5,338,000
March	2,953,000	22,583,000	3,747,000	6,675,000
April	2,416,000	18,575,000	2,928,000	5,406,000
May	2,744,000	21,597,000	3,519,000	6,274,000
June	2,953,000	18,768,000	3,321,000	6,126,000
July	3,447,000	17,630,000	3,168,000	5,157,000
August	4,618,000	21,289,000	3,461,000	4,806,000
September	4,966,000	21,451,000	2,725,000	5,298,000
October	5,914,000	21,982,000	2,297,000	5,527,000
November	4,178,000	18,686,000	2,649,000	5,201,000
December	2,348,000	18,811,000	2,771,000	5,271,000
1929:				
January	2,828,000	19,975,000	3,876,000	6,033,000
	3,095,000	18,979,000	2,869,000	6,135,000
March	3,952,000	17,226,000	2,746,000	7,013,000
April	4,000,000	17,256,000	2,601,000	7,035,000
May	4,860,000	19,541,000	2,916,000	7,189,000
June	4,409,000	20,007,000	2,502,000	6,792,000
July	4,260,000	19,315,000	1,295,000	6,306,000
August	5,085,000	23,095,000	2,948,000	6,792,000
September	5,507,000	21,702,000	2,841,000	5,906,006
October	6,116,000	22,386,000	3,502,000	5,887,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	987,088	3,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,048	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,256	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,306	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,975	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	—	399	165,460	451	126,962	147	60,738
Sept.	—	—	60	38,196	2,028	713,736	125	56,768
Oct.	—	—	121	59,358	429	129,065	239	94,570
Nov.	—	—	59	41,119	472	140,116	88	35,409
Dec.	—	—	85	58,311	522	156,154	145	59,911
1929:								
Jan.	—	—	46	30,374	434	152,260	135	62,950
Feb.	—	—	82	70,209	823	255,594	40	19,806
Mar.	—	—	90	75,444	428	122,026	1	1,140
Apr.	83	38,241	163	93,240	1,086	315,621	1	1,086
May	125	57,260	76	67,891	752	212,400	76	24,053
June	145	62,808	31	26,038	802	248,143	77	25,612
July	200	86,175	49	46,440	572	180,065	14	5,807
Aug	190	80,443	58	47,769	575	171,783	—	—
Sept.	107	51,156	38	30,327	913	279,225	—	—
Oct.	200	79,968	58	43,756	636	181,421	—	—
Nov.	125	47,796	13	11,600	583	182,677	49	14,935

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1920	86,395	75,297	38.4	.....
1921	86,725	41,351	24.1	.....
1922	57,884	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1924	80,079	76,072	22.4	.....
1927:				
Jan.	16,526	12,874	39.3	25,908
Feb.	15,860	14,424	47.5	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	20,140	58.5	21,941
Feb.	15,291	18,670	55.4	20,843
Mar.	17,089	20,680	57.9	19,588
Apr.	15,398	19,280	58.8	19,283
May	18,945	20,215	54.1	18,187
June	18,781	18,140	48.2	18,709
1929:				
Jan.	19,685	21,068	49.1	24,394
Feb.	19,094	19,829	47.7	23,805
Mar.	19,984	20,867	46.7	22,076
Apr.	19,899	22,435	47.3	20,680
May	20,385	23,176	47.1	19,479
June	18,416	18,141	42.0	17,980

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,218
1927	189,144	178,471	47.6	24,980
1928	208,516	223,000	50.4	24,785
1929	218,954	226,588	48.4	27,464
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,886	47.3	25,157
Sept.	14,392	14,790	54.3	23,429
Oct.	16,127	17,292	54.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	15,481	52.7	24,980
July	17,278	19,070	51.0	17,305
Aug.	19,049	17,890	41.7	15,881
Sept.	18,693	17,795	44.6	17,991
Oct.	17,182	18,420	45.1	17,026
Nov.	18,245	18,320	49.1	22,399
Dec.	17,728	14,320	45.9	24,785
July	18,387	20,236	48.7	19,679
Aug.	19,787	18,230	47.6	22,309
Sept.	18,660	17,071	49.2	24,984
Oct.	18,865	18,744	53.8	25,117
Nov.	14,363	15,330	55.4	26,080
Dec.	13,429	11,531	49.0	27,464

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927 and 9,577 tons in 1928.

REVIEW DESK

Books, New Publications, Catalogues, Etc.

THE COLLOID CHEMISTRY OF RUBBER. By Paul Stamberger. Published by the Oxford University Press, London, England, and 114 Fifth Avenue, New York City. 1929. 88 pp. $2.00.

Comprising the second series of the Gow Lectures on colloid chemistry and its relation to the rubber industry, delivered in November, 1928, at University College, London, this study is a systematic description of the colloidal behavior of rubber. Among the subjects covered in detail are rubber latex and its industrial applications, lyophile colloids (gels), crude rubber and its solvation, compounding ingredients, rubber substitutes, synthesis of rubber, vulcanization, devulcanization, and the structure of rubber.

AMERICA IN THE SKYWAYS. Published by the Goodyear-Zeppelin Corporation, Akron, O. 1929. 36 pp.

Handsomely illustrated, printed and bound, this souvenir publication for the occasion of the laying of the master ring of the United States Airship ZRS-4 at the Goodyear-Zeppelin hangar last November traces the history of lighter than air craft and describes the non-rigid, semi-rigid and rigid types. It hails the development of these large dirigibles in this country as an evidence of the coming strength of America's position in the air.

A STUDY OF THE EFFECT OF DAMP STORAGE ON RAW RUBBER. By B. J. Eaton and R. G. Fullerton. Published by the Rubber Research Institute of Malaya, Kula Lumpur, F. M. S. October, 1929. 32 pp. $1 (Malaya).

In response to complaints in recent years in connection with the development of moulds on smoked sheet rubber, investigations were carried out in 1927 and 1928 of the relationship between mould development and moisture absorption by rubber when kept in damp storage, the effect of mould development on loss of weight of the raw rubber, and the effect of mould development on the nitrogen content of the rubber. The conclusions of the study are given in full in this paper.

RUBBER RESEARCH IN HOLLAND. By Dr. A. Van Rossem. Published by the Netherland Government Rubber Institute, Poortlandlaan 35, Delft, Holland. 1929. 12 pp. For free distribution.

Established in 1909, the Netherlands Government Rubber Institute has for twenty years been carrying out special investigations, testing work and research studies for the benefit of the rubber industry. Its studies of the freezing of raw rubber, the composition of the acetone extract of raw rubber, the calender effect of masticated rubber, and of the first period of the oxidation process of vulcanized rubber are well known. This review of the history and scope of the institute is reprinted from the recent International Issue of the *India-Rubber Journal*.

DIATOMACEOUS EARTH. By Dr. Robert Calvert. An American Chemical Society Monograph issued by the Chemical Catalogue Company, Inc., 419 Fourth Avenue, New York City. 1930. 256 pp. $5.00.

The applications of diatomaceous earth are being extended so rapidly to new industries that there has been a twenty-fold increase in the United States production since 1920. As a reenforcing agent or filler for rubber, for example, this earth has advantages, chiefly in compositions for hard rubber in which there may be a substitution for fine white clay. This use was covered by David S. Collins in a study published in THE RUBBER AGE in May, 1919 (5:101). Dr. Calvert's volume is an exhaustive study of the subject, discussing the production and all industrial uses of the earth.

A PICTURE OF WORLD ECONOMIC CONDITIONS IN THE SUMMER OF 1929. Published by the National Industrial Conference Board, Inc., 247 Park Avenue, New York City. 1929. 320 pp. $2.50.

An analysis of the condition of industry and trade in twenty-two foreign countries and the United States, this work is divided into two parts. The first section presents and interprets the major statistics of industrial production, wages and employments, prices, etc., while the second part is a compilation of nineteen special articles from an eminent group of foreign correspondents, all of whom are authorities on the economic life of their respective countries. Alberto Pirelli, head of the rubber company which bears his name, is, for example, a correspondent in Italy. Of especial interest is an article on "The Relation of Colonies to Dutch Economic Life" by E. Heldring, president of the Royal Netherlands Steamship Company, which describes the importance of rubber production in the Netherlands East Indies and balata production in the Netherlands West Indies.